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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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No. 11-6625-274-12/1

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TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

1. **Operation.** The following instructions are keyed to the table of test data given in paragraph 2. For complete operating instructions see TM 11-6625-274-12, Operator's and Organizational Maintenance Manual, Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

a. Turn the POWER switch to the ON position.

b. Press push button 1-LINE ADJ and hold it down. Slowly rotate the LINE ADJUST control knob until the pointer of the meter rests over the LINE TEST mark. This adjustment is not required for all tubes (refer to *Notations* column).

c. Locate the type number of the tube to be tested (par. 2) under the column heading *Tube type.*

d. Refer to the *Notations* column for special information pertaining to specific types of tubes.

e. Set the FILAMENT VOLTAGE switch at the voltage shown under the heading *Fil.*

f. Set the selector switches as indicated under the column headed *Selectors* in the following order: FILAMENT (left), FILAMENT (right), GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR.

g. Set the BIAS dial at the value listed in the *Bias* column.

h. Set the SHUNT dial at the value listed under *Shunt.* If no setting is indicated for this dial, omit this step, and proceed with the next operation.

i. Set the FUNCTION SWITCH to the No. 1 position.

j. Insert the tube to be tested in the proper socket.

k. Readjust the line voltage (*b* above).

l. Rotate the FUNCTION SWITCH through SHORTS positions 1, 2, 3, 4, and 5. If the neon lamp glows steadily, or intermittently under light tapping, a short is indicated and the tube should be discarded, with the exception of tubes which normally show shorts in certain positions as indicated under the *Notations* column. Disregard momentary flashes between switch positions. Multisection tubes must be tested for shorts for each section. On all selector switch settings in which the CATHODE selector switch and the SUPPRESSOR selector switch are set for a common pin number (except 0 and 1) the FUNCTION switch will indicate short on positions 2 and 3.

m. Allow sufficient time for the tube to warm up and repeat the shorts test (*l* above).

n. Turn the FUNCTION SWITCH to the proper RANGE position as indicated under the column headed *Range.*

o. Press the pushbutton listed in the *Press* column. Read the meter as soon as its needle comes to rest and immediately release the pushbutton.

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*This bulletin supersedes TB 11-5083-1/TO 33AA21-5-1, 9 October 1957, including C 1, 22 December 1958; C 2, 1 April 1959; C 3, 10 February 1960; and C 4, 16 June 1960.

q. To test amplifier tubes for gas content, hold down pushbutton 4-GAS 1 and rotate the BIAS dial until the meter indicates one large division or a reading of 10 on the scale. While pushbutton 4-GAS 1 is held down, press pushbutton 5-GAS 2. If the tube under test contains gas, the meter will move upscale. A movement of more than one small division indicates a gassy tube. If the adjustment of the BIAS dial does not bring the pointer of the meter down to the first large division, turn the BIAS dial to 100, hold down pushbutton 4-GAS 1, and press pushbutton 5-GAS 2. A movement of more than one small division indicates a gassy tube.

Note. The gas test may be made without first making the GM test.

2. Data Table. Where a crosshatch (#) symbol appears in the test data, read the notations carefully before testing the tube. Where a star (*) follows the type number, refer to the basing diagrams for subminiature tubes given in TM 11-6625-274-12.

Caution: **Never hold the pushbutton down longer than necessary to make the reading. Holding the pushbutton down too long may damage the tube.**

p. If the numerical value of the meter reading is less than the minimum acceptable value listed under the heading *Min value*, replace the tube. If the tube tests good, continue the test by testing for gas (*q* below).

Note. The meter indication for tube types such as pentagrid converters, mixers, thyratrons, and voltage regulators (listed below) is not a true and conclusive measurement of the tube condition and value. The final determination of the condition of the tube should be made by an operational test in equipment known to meet the applicable repair standard. In some equipments, it is necessary to substitute a known good tube of the same type to obtain a true indication of the tube's condition. Do not discard a tube which does not operate satisfactorily in the equipment, if the test set indicates that the tube is good. The tube may operate satisfactorily in another circuit.

0A2	2C4	6SA7	837
0A3	2C53	6SB7	874
0A4	2D21	6T5	884
0B2	2E24	6U5	885
0B3	2E26	7A8	1258
0C3	3C24	7B8	1612
0D3	6A7	7J7 Heptode only	1629
0Y4	6A8	7Q7	1635
HK24	6AB5/6N5	7S7 Heptode only	2050W
1A6	6AC5	12A8	2051
1A7	6AD6	12BA7	5643
1B7	6AF6	12BE6	5644
1C6	6BA7	12K8 Heptode only	5651
1C7	6BE6	12SA7	5663
1C8	6D4	12SY7	5696
1C21	6D8	14B8	5722
1LA6	6E5	14J7 Heptode only	5750
1LC6	6H5	14Q7	5763
1R5	6J8 Heptode only	14S7 Heptode only	5783
2A4	6K8 Hexode only	25AC5	5787
2A7	6L7	26D6	5842
2B4	6Q5	313C	5847
			5915

DATA TABLE

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
OOA	5.0	ER3-2000	33	.....	B	3	17	
O1A	5.0	ER3-2000	48	.....	B	3	18	
OA2	BLST	AP0-5020	0	32	A	4	40	Short on 1, 2, 3, 4, and 5.
OA3	.....	HP0-5020	0	60	A	4	40	
OA4G	.....	KR0-5720	100	85	A	4	40	
OB2	.....	AP0-5020	0	40	A	4	40	Short on 1, 2, 3, 4, and 5.
OB3	.....	HP0-5020	0	65	A	4	40	
OC3	.....	HP0-5020	0	60	A	4	40	
OD3	.....	HP0-5020	0	40	A	4	40	
OY4	BLST	HY3-5010	0	53	A	6	40	Short on 1 and 2.
OZ4	.....	HS0-5080	0	70	A	6	40	Plate No. 1.
	Hold down pushbutton 6-0Z4 for 5 seconds.							
OZ4	.....	HS0-3080	0	70	A	6	40	Plate No. 2.
	Hold down pushbutton 6-0Z4 for 5 seconds.							
OZ4A	.....	HS0-5080	0	70	A	6	40	Plate No. 1.
	Hold down pushbutton 6-0Z4 for 5 seconds.							
OZ4A	.....	HS0-3080	0	70	A	6	40	Plate No. 2.
	Hold down pushbutton 6-0Z4 for 5 seconds.							
1A3	1.5	HR0-2030	0	0	A	2	28	
1A4	2.0	ER0-2300	18	.....	B	(#)	19	Cap connects to grid No. 4.
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
1A5	1.5	HS5-3400	43	.....	B	3	20	
1A6	2.0	GR4-5320	75	.....	B	3	11	Cap connects to grid No. 4.
1A7	1.5	HS5-4630	85	.....	B	3	9	Cap connects to grid No. 4.
1AB5	1.1	JR6-2300	0	.....	B	3	36	
1AC5*	1.1	EV2-7800	22	.....	B	(#)	10	F basing.
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
1AD4	1.1	DV4-1200	28	.....	B	3	35	
1AD5*	1.1	EV2-7800	0	.....	B	(#)	16	F basing.
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
1AE4	1.1	BX6-2300	22	.....	B	3	24	
1AF4	1.5	BX6-2300	21	.....	B	3	18	
1AF5	1.5	BX6-5400	0	.....	B	(#)	15	Pentode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1AF5	1.5	BX0-3000	0	0	A	2	10	Diode sect.
1AG4	1.1	DV4-1200	31	———	B	(#)	18	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1AG5	1.1	EW5-1203	40	0	A	4	20	Pentode sect.
1AG5	1.1	EW0-3000	0	0	A	2	20	Diode sect.
1AH4	1.1	FT4-1200	33	0	A	4	40	
1AJ4	1.5	HR6-2300	33	———	A	3	36	
1AJ5	1.1	EW5-1203	16	———	B	(#)	11	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1AJ5	1.1	EW0-3000	0	18	A	2	40	Diode sect.
1AK4	1.1	FT4-1200	33	0	A	4	40	
1AK5	1.1	EW5-1203	40	0	A	4	20	Pentode sect.
1AK5	1.1	EW0-3000	0	0	A	2	20	Diode sect.
1AU3	1.1	HS0-0000	0	0	A	4	38	Cap connects to plate.
1AX2	1.5	BS0-0000	0	30	A	4	40	Cap connects to plate.
1B3	1.1	HS0-0000	0	68	A	4	40	Cap connects to plate.
1B4	2.0	ER0-2300	18	———	B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1B5	2.0	GR5-2000	28	———	B	3	14	Triode sect.
1B5	2.0	GR5-4000	0	11	A	2	40	Diode No. 1.
1B5	2.0	GR5-3000	0	21	A	2	40	Diode No. 2.
1B7	1.5	HS5-4630	68	———	B	(#)	23	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1C3	1.5	BX4-2000	37	———	B	3	19	
1C5	1.5	HX5-3400	37	———	B	3	19	
1C6	2.0	GR4-5320	56	———	B	(#)	25	Cap connects to grid No. 4.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1C7	2.0	HS-4630	56	———	B	(#)	25	Cap connects to grid No. 4.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1C8*	1.1	EV8-6702	45	———	B	3	10	F basing. Short on 3.
1C21	BLST	HP7-5020	0	83	A	4	40	
1D5	2.0	HS0-3400	18	———	B	(#)	19	Cap connects to grid.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1D7	2.0	HS5-4630	75		B	3	11	Connects to grid No. 4.
1D8	1.5	HS5-3460	50		B	3	23	Pentode sect.
1D8	1.5	HS5-6430	11		B	3	14	Triode sect. Cap connects to grid.
1D8	1.5	HS5-8430	0	0	A	2	24	Diode sect.
1DN5	1.5	BX6-2300	32		B	3	16	Pentode sect.
1DN5	1.5	HR0-4000	0	0	A	2	16	Diode sect.
1E3	1.1	EV1-8000	24		C	3	38	
1E4	1.5	HS5-3000	37		B	3	21	
1E5	2.0	HS0-3400	18		B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1E7	2.0	HS5-6834	21		B	3	29	Pentode No. 1.
1E7	2.0	HS4-3865	21		B	3	29	Pentode No. 2.
1F4	2.0	FR3-2400	23		B	3	35	
1F5	2.0	HS5-3400	23		B	3	35	
1F6	2.0	GR0-2300	8		B	(#)	16	Pentode sect. Cap connects to grid No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1F6	2.0	GR0-5300	0	0	A	2	19	Diode No. 1.
1F6	2.0	GR0-4300	0	0	A	2	22	Diode No. 2.
1F7	2.0	HS0-3600	8		B	(#)	16	Pentode sect. Cap connects to grid No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1F7	2.0	HS0-4630	0	0	A	2	19	Diode No. 1.
1F7	2.0	HS0-5630	0	0	A	2	22	Diode No. 2.
1G3	1.1	HS0-0000	0	68	A	4	40	Cap connects to plate.
1G4	1.5	HS5-3000	49		B	3	21	
1G5	2.0	HS5-3400	37		B	3	38	
1G6	1.5	HS5-6000	16		B	3	17	Triode No. 1.
1G6	1.5	HS4-3000	16		B	3	17	Triode No. 2.
1H2	1.5	BS0-0000	0	55	A	4	32	Cap connects to plate.
1H4	2.0	HS5-3000	40		B	3	23	
1H5	1.5	HS0-3000	16		B	3	7	Triode sect. Cap connects to grid.
1H5	1.5	HS0-5000	0	0	A	2	40	Diode sect.
1H6	2.0	HS6-3000	23		B	3	14	Triode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
1H6	2.0	HS6–5000	0	11	A	2	40	Diode No. 1.
1H6	2.0	HS6–4000	0	21	A	2	40	Diode No. 2.
1J3	1.1	HS0–0000	0	0	A	4	38	Cap connects to plate.
1J5	2.0	HS5–3400	45	———	B	3	24	
1J6	2.0	HS5–6000	15	———	B	3	25	Triode No. 1.
1J6	2.0	HS4–3000	15	———	B	3	25	Triode No. 2.
1K3	1.1	HS0–0000	0	0	A	4	38	Cap connects to plate.
1L4	1.5	HR6–2300	19	———	B	3	26	
1L6	1.5	BX4–5362	65	———	B	3	16	
1LA4	1.5	JR6–2300	43	———	B	3	20	
1LA6	1.5	JR4–5362	75	———	B	3	14	
1LB4	1.5	JR6–2300	51	———	B	3	23	
1LB6	1.5	JR6–2437	Short test only.					
1LB6	1.5	JR6–4375	20	———	B	3	19	
1LC5	1.5	JR6–2340	0	———	B	(#)	19	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1LC6	1.5	JR6–2534	Short test only.					
1LC6	1.5	JR4–3526	30	———	B	(#)	14	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1LD5	1.5	JR6–2300	0	———	B	(#)	15	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1LD5	1.5	JR6–4300	0	0	A	2	25	Diode sect.
1LE3	1.5	JR6–2050	20	———	B	3	30	
1LF3	1.5	JR6–2050	20	———	B	3	30	
1LG5	1.5	JR6–2340	25	———	B	3	26	
1LH4	1.5	JR6–2000	16	———	B	3	7	Triode sect.
1LH4	1.5	JR6–4000	0	0	A	2	40	Diode sect.
1LN5	1.5	JR6–2340	11	———	B	3	19	
1M3	1.5	EV1–8000	0	———	D	4	———	Adjust bias to vary bar length. Do not adjust bias below 25.
1N2	1.1	HS0–0000	0	68	A	4	40	Cap connects to plate.
1N5	1.5	HS0–3400	11	———	B	3	19	Cap connects to grid.
1N6	1.5	HS5–3400	43	———	B	3	20	Pentode sect.
1N6	1.5	HS0–6000	0	0	A	2	18	Diode sect.
1P5	1.5	HS0–3400	11	———	B	3	20	Cap connects to grid.
1Q5	1.5	HS5–3400	37	———	B	3	53	
1Q6*	1.1	EV2–7800	0	———	B	(#)	8	F biasing. Pentode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1Q6*	1.1	EV0–6000	0	0	A	2	10	F basing. Diode sect.
1R4	1.5	JR0–4070	0	27	A	2	40	Diode.
1R5	1.5	BX4–3062	68	.....	B	3	13	
1S2A	1.5	BS0–0000	0	69	A	4	32	Cap connects to plate.
1S4	1.5	BX3–2400	31	.....	B	(#)	38	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1S5	1.5	BX6–5400	13	.....	B	(#)	13	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1S5	1.5	BX0–3400	0	0	A	2	34	Diode sect.
1S6*	1.1	EV3–1806	0	.....	B	(#)	9	F basing. Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1S6*	1.1	EV0–6000	0	0	A	2	10	F basing. Diode sect.
1SA6	1.5	HS4–8630	0	.....	B	(#)	20	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1SB6	1.5	HS8–3400	0	.....	B	(#)	16	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1SB6	1.5	HS8–5000	0	0	A	2	20	Diode sect.
1T4	1.5	BX6–2300	0	.....	B	(#)	19	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1T5	1.5	HS5–3400	45	.....	B	3	29	
1T6*	1.1	EV3–1860	0	.....	B	(#)	5	F basing. Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1T6*	1.1	EV0–6000	0	0	A	2	10	F basing. Diode sect.
1U4	1.5	BX6–2300	14	.....	B	3	22	
1U5	1.5	BX6–2300	34	.....	B	3	13	Pentode sect.
1U5	1.5	BX6–4300	0	0	A	2	34	Diode sect.
1U6	1.5	BX4–5362	65	.....	B	3	12	
1V	6.3	ER0–2030	0	53	A	7	40	
1V2	0.6	EV0–1000	0	49	A	4	40	
1V5*	1.1	EV2–7800	24	.....	B	(#)	18	F basing.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1V6	1.1	EX3–1206	33	0	A	4	20	Pentode sect.
1V6	1.1	EX5–6001	50	0	A	4	20	Triode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
1W4	1.5	BX6–2300	49	———	B	3	23	
1W5*	1.1	EV2–7800	33	———	B	3	12	F basing.
1X2	1.5	BS0–0000	0	68	A	4	40	Cap connects to plate.
1Z2	1.5	BS0–0000	0	53	A	4	40	Cap connects to plate.
2A3	2.5	ER3–2000	67	———	C	3	38	
2A4	2.5	HS5–3000	(#)	60	A	7	40	
#Should strike between settings 86 and 76 of the BIAS dial.								
2A5	2.5	GR4–2350	29	———	B	3	50	
2A6	2.5	GR0–2050	11	———	B	3	19	Triode sect. Cap connects to grid.
2A6	2.5	GR0–4050	0	14	A	2	40	Diode No. 1.
2A6	2.5	GR0–3050	0	14	A	2	40	Diode No. 2.
2A7	2.5	HR5–3462	41	———	B	3	29	Cap connects to grid No. 4.
2AF4	2.5	ET2–1050	36	———	D	3	23	
2B3	1.5	HS0–0000	0	68	A	4	40	Cap connects to plate.
2B4	2.5	FR3–2040	(#)	90	A	4	40	
#Should strike between settings 82 and 72 of the BIAS dial.								
2B6	2.5	HR4–2360	15	———	B	3	38	
2B7	2.5	HR0–2360	30	———	B	2	25	Pentode sect. Cap connects to grid.
2B7	2.5	HR0–5360	0	14	A	2	40	Diode No. 1.
2B7	2.5	HR0–4360	0	14	A	2	40	Diode No. 2.
2B22	6.3	HS0–0080	0	50	A	7	40	Cap connects to plate.
2B23	6.3	HS0–3080	0	0	A	6	20	
2BN4	2.0	ET2–5010	15	———	D	3	34	
2BN4A	2.0	ET2–5010	20	———	D	3	32	
2C4	2.5	HR3–5050	(#)	90	A	4	40	
#Should strike between settings 81 and 71 of the BIAS dial.								
2C21	6.3	HR4–5060	38	———	B	3	34	Triode No. 1.
2C21	6.3	HR0–3020	38	———	B	3	34	Triode No. 2. Cap connects to grid.
2C22	6.3	HS0–0080	13	———	C	3	38	Upper cap connects to grid. Lower cap connects to plate.
2C26	6.3	HS0–0080	18	———	B	3	38	Right caps connects to plate. Left cap connects to grid.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
2C39	6.3	HS6-5080	18		E	3	50	TV-7/U, TV-7A/U, TV-7B/U ONLY.
			Use adapter E107.					
2C39	6.3	HS6-5080	78	0	F	3	50	TV-7D/U ONLY.
2C40	6.3	HS0-0080	17		C	3	35	Cap connects to plate.
2C42	6.3	HS0-0080	10		D	3	38	Cap connects to plate. Ring connects to grid. Ring connects to grid.
2C43	6.3	HS0-0080	17		C	3	56	Cap connects to plate. Ring connects to grid.
2C45	7.5	ER3-2000	37		B	3	55	
2C46	6.3	HS0-0080	9		B	3	24	Cap connects to plate. Ring connects to grid.
2C50	12.6	HY1-2030	41		B	3	45	Triode No. 1.
2C50	12.6	HY4-5060	41		B	3	45	Triode No. 2.
2C51	6.3	KR7-6082	17		D	3	26	Triode No. 1.
2C51	6.3	KR3-4028	17		D	3	26	Triode No. 2.
2C52	12.6	HY4-5062	15		B	3	25	Triode No. 1.
2C52	12.6	HY1-2035	15		B	3	25	Triode No. 2.
2C53	6.3	HS5-0080	0		B	3	10	Cap connects to plate.
2CW4	2.0	DR4-2080	16		D	3	44	Use Hickok adapter Code No. 1050-127.
2CY5	2.5	ET1-5620	11		D	(#)	25	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2D21	6.3	ET1-6025	(#)	90	A	4	40	
#Should strike between settings 40 and 30 of the BIAS dial.								
2EA5	2.5	ET1-5620	10		D	3	26	
2EN5	2.0	ET0-7056	0	55	A	2	30	Diode No. 1.
2EN5	2.0	ET0-2056	0		D	3	49	Diode No. 2.
2ER5	2.0	ET2-5670	10		D	3	49	
2E5	2.5	GR5-4030	0	100	A	3		Eye open.
2E5	2.5	GR5-4230	0	100	A	3		Eye closed.
2E22	6.3	FR3-0240	0		C	3	50	Cap connects to plate.
2E24	6.3	HS5-0300	35		C	3	40	Cap=P. Short on 8.
2E25	6.3	HS5-0408	0		C	3	88	Cap=P.
2E26	6.3	HS5-0318	37		C	3	44	Cap=P.
2E30	6.3	ET1-5602	20		C	3	88	
2E31	1.1	DV4-1200	0		B	(#)	10	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E32	1.1	DV4-1200	0		B	(#)	10	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E35	1.1	DV4-1200	18	------	B	(#)	15	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E36	1.1	DV4-1200	18	------	B	(#)	15	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E41	1.1	EW5-1200	20	------	B	(#)	10	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E41	1.1	EW0-3000	0	0	A	2	5	Diode sect.
2E42	1.1	EW5-1200	20	------	B	(#)	10	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
2E42	1.1	EW0-3000	0	0	A	2	5	Diode sect.
2ES5	2.5	ET2-5010	12	------	D	3	35	
2EV5	2.5	ET1-5620	10	------	D	3	43	
2FH5	2.5	ET2-5070	13	------	D	3	40	
2FQ5	2.5	ET2-5070	15	------	D	3	42	
2FS5	2.5	ET1-5670	10	------	D	3	30	
2FY5	2.5	ET2-5016	14	------	D	3	50	
2G21	1.1	EX3-2651	53	0	A	4	20	Heptode sect.
2G21	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2G22	1.1	EX3-2651	53	0	A	4	20	Heptode sect.
2G22	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2GK5	2.5	ET2-5076	30	------	C	3	38	
2T4	2.5	ET2-1050	37	------	D	3	25	
2V2	2.5	HS0-0050	0	45	A	4	40	Cap connects to plate. Short on 3.
2V3	2.5	HS0-0000	0	68	A	4	40	Cap connects to plate.
2W3	2.5	JS0-4000	0	0	A	7	40	
2X2A	2.5	ER0-0000	0	78	A	4	40	Cap connects to plate.
2Z2	2.5	ER0-2000	0	0	A	7	34	
3A2	3.0	BS0-0000	0	76	A	4	40	Cap connects to plate.
3A3	3.0	HS0-0000	0	62	A	4	40	Cap connects to plate.
3A4	2.5	BX4-2300	33	------	B	3	50	
3A5	3.0	BX5-6000	32	------	B	3	50	Triode No. 1.
3A5	3.0	BX3-2000	22	------	B	3	50	Triode No. 2.
3A8	2.5	HS0-3400	12	------	B	3	19	Pentode sect. Cap connects to grid No. 1. Short on 3.
3A8	2.5	HS5-6400	12	00	B	3	13	Triode sect. Short on 3.
3A8	2.5	HS0-8400	0	0	A	2	40	Diode sect. Short on 3.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
3AF4A	3.0	ET2-1050	36	------	D	3	23	
3AL5	3.0	ET0-7010	0	70	A	2	40	Diode No. 1.
3AL5	3.0	ETC-2050	0	70	A	2	40	Diode No. 2.
3AU6	3.0	ET1-5672	16	------	B	3	58	
3AV6	3.0	ET1-7025	12	------	B	3	32	Triode sect.
3AV6	3.0	ET1-6025	0	0	A	2	40	Diode No. 1.
3AV6	3.0	ET1-5027	0	0	A	2	40	Diode No. 2.
3AW3	3.0	HS0-0000	0	62	A	4	40	Cap connects to plate.
3B2	3.0	HS0-0000	0	54	A	4	40	Cap connects to plate. Short on 3.
3B4	2.5	EV3-7100	55	------	B	3	43	
3B5	2.5	HS5-3400	60	------	B	3	38	
3B7	2.5	JR6-7000	12	------	B	3	38	Triode No. 1.
3B7	2.5	JR3-2000	25	------	B	3	38	Triode No. 2.
3B24	2.5	ER0-0000	0	84	A	4	40	Cap connects to plate. 1st half of fil.
3B24	2.5	CR0-0000	0	84	A	4	40	Cap connects to plate. 2d half of fil.
3B25	2.5	ER0-0000	0	90	A	4	40	Cap connects to plate.
3B28	2.5	ER0-0000	0	90	A	4	40	Cap connects to plate.
3B29	3.0	ER0-0000	0	87	A	4	40	Cap connects to plate.
3BA6	3.0	ET1-5672	9	------	C	3	41	
3BC5	3.0	ET1-5620	0	------	C	3	40	
3BE6	3.0	ET7-5621		Short test only.				
3BE6	3.0	ET1-6027	17	------	D	3	36	
3BN4	3.0	ET2-5010	15	------	D	3	34	
3BN4A	3.0	ET2-5010	20	------	D	3	32	
3BN6	3.0	ET2-7516	0	------	B	3	18	Limited grid.
3BN6	3.0	ET6-7512	0	------	B	3	23	Quadrature grid.
3BU8	3.0	EV7-8219	0	------	B	3	33	Pentode No. 1.
3BU8	3.0	EV7-3216	0	------	B	3	33	Pentode No. 2.
3BX6	3.0	EV2-7819	13	------	C	3	38	
3BY6	3.0	ET1-5627	21	------	B	3	30	Grid No. 1.
3BY6	3.0	ET7-5621	21	------	B	(#)	13	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
3BZ6	3.0	ET1-5627	20	------	C	3	32	
3C2	3.0	HS0-0000	0	72	A	4	40	Cap connects to plate.
3C4	2.5	BX6-2300	44	------	B	3	28	
3C6	2.5	BY5-6000	10	------	B	3	28	Triode No. 1.
3C6	2.5	JR4-3000	10	------	B	3	28	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
3C22	6.3	HS0-0000	13	------	D	3	25	Short on 3.
		Radiating fins connect to plate. Center ring connects to grid.						
3C24	6.3	ER0-0000	0	------	B	3	25	Top cap connects to plate. Slide cap connects to grid.
3CB6	3.0	ET1-5627	11	------	D	3	28	
3CE5	3.0	ET1-5620	11	------	D	3	28	
3CF6	3.0	ET1-5627	11	------	D	3	28	
3CS6	3.0	ET1-5627	20	------	B	(#)	8	Grid No. 1.
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
3CS6	3.0	ET7-5621	0	------	B	(#)	12	Grid No. 3.
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
3CY5	3.0	ET1-5620	11	------	D	(#)	25	
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
3D21A	12.6	H56-0480	30	------	D	3	26	Short on 3.
3D6	2.5	JR6-2300	37	------	B	3	52	
3DG4	3.0	DR0-7000	0	36	A	7	80	Diode No. 1.
3DG4	3.0	DR0-5000	0	36	A	7	80	Diode No. 2.
3DK6	3.0	ET1-5627	8	------	D	3	33	
3DT6	3.0	ET1-5627	22	------	B	3	15	Grid No. 1
3DT6	3.0	ET7-5621	0	------	B	(#)	10	Grid No. 3.
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
3EA5	3.0	ET1-5620	10	------	D	3	26	
3ER5	3.0	ET2-5670	10	------	D	3	49	
3EV5	3.0	ET1-5620	10	------	D	3	43	
3E5	2.5	BX6-2350	29	------	B	(#)	30	Short on 3.
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
3E6	3.0	JR6-2340	15	------	B	3	40	
3E29	6.3	HS4-5613	0	------	D	3	20	Plate No. 1.
				Use adapter E105.				
3E29	6.3	HS4-8613	0	------	D	3	20	Plate No. 2.
				Use adapter E105.				
3FH5	3.0	ET2-5070	13	------	D	3	40	
3FQ5	3.0	ET2-5070	15	------	D	3	42	
3FY5	3.0	ET2-5070	14	------	D	3	50	
3GK5	3.0	ET2-5076	30	------	C	3	38	
3GS8	3.0	EV7-8219	0	------	B	3	28	Pentode No. 1.
3GS8	3.0	EV7-3216	0	------	B	3	28	Pentode No. 2.
3LE4	2.5	JR6-2300	55	------	B	3	28	
3LF4	2.5	JR6-2300	30	------	B	3	48	
3Q4	3.0	HR3-2400	24	------	B	3	54	
3Q5	2.5	HS5-3400	38	------	B	3	45	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
3S4	2.5	HR3-2400	28	------	B	(#)	38	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
3V4	3.0	BX6-2300	31	------	B	3	50	
4A6	3.0	HS5-6000	16	------	B	3	25	Triode No. 1.
4A6	3.0	CX4-3000	16	------	B	3	25	Triode No. 2.
4AU6	4.3	ET1-5672	16	------	B	3	58	
4AV6	4.3	ET1-7025	12	------	B	3	32	Triode sect.
4AV6	4.3	ET1-6025	0	0	A	2	40	Diode No. 1.
4AV6	4.3	ET1-5027	0	0	A	2	40	Diode No. 2.
4BA6	4.3	ET1-5672	9	------	C	3	41	
4BC5	4.3	ET1-5620	0	------	C	3	40	
4BC8	4.3	EV7-6089	15	------	D	3	31	Triode No. 1.
4BC3	4.3	EV2-1039	15	------	D	3	31	Triode No. 2.
4BE6	4.3	ET7-5621			Short test only			
4BE6	4.3	ET1-6027	17	------	D	3	36	
4BL8	4.3	EV2-6371	19	------	C	3	34	Pentode sect.
4BL8	4.3	EV9-1086	34	------	C	3	36	Triode sect.
4BN4	4.3	ET2-5010	15	------	D	3	34	
4BN6	4.3	ET2-7516	0	------	B	3	18	Limiter grid.
4BN6	4.3	ET6-7512	0	------	B	3	23	Quadrature grid.
4BQ7A	4.3	EV7-6089	14	------	D	3	32	Triode No. 1.
4BQ7A	4.3	EV2-1039	14	------	D	3	32	Triode No. 2.
4BS8	4.3	EV7-6089	17	------	D	3	36	Triode No. 1.
4BS8	4.3	EV2-1039	17	------	D	3	36	Triode No. 2.
4BU8	4.3	EV7-8219	0	------	B	3	33	Pentode No. 1.
4BU8	4.3	EV7-3216	0	------	B	3	33	Pentode No. 2.
4BX8	4.3	EV7-6089	24	------	D	3	25	Triode No. 1.
4BX8	4.3	EV2-1039	24	------	D	3	25	Triode No. 2.
4BZ6	4.3	ET1-5627	20	------	C	3	32	
4BZ7	4.3	EV7-6089	17	------	D	3	34	Triode No. 1.
4BZ7	4.3	EV2-1039	17	------	D	3	34	Triode No. 2.
4BZ8	4.3	EV7-6089	16	------	D	3	30	Triode No. 1.
4BZ8	4.3	EV2-1039	16	------	D	3	30	Triode No. 2.
4CB6	4.3	ET1-5627	11	------	D	3	28	
4CE5	4.3	ET1-5620	11	------	D	3	28	
4CS6	4.3	ET1-5627	20	------	B	(#)	8	Grid No. 1.
4CS6	4.3	ET7-5621	0	------	B	(#)	12	Grid No. 3.
4CY5	4.3	ET1-5620	11	------	D	(#)	25	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
4DE6	4.3	ET1-5627	11	------	D	3	28	
4DT6	4.3	ET1-5627	22	------	B	3	15	Grid No. 1.
4DT6	4.3	ET7-5621	0	------	B	(#)	10	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
4ES8	4.3	EV7-6080	20	------	D	3	50	Triode No. 1.
4ES8	4.3	EV2-1030	20	------	D	3	50	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
4EW6	4.3	ET1-5627	26	------	B	3	52	
4GS8	4.3	EV7-8219	0	------	B	3	28	Pentode No. 1.
4GS8	4.3	EV7-3216	0	------	B	3	28	Pentode No. 2
5A6	5.0	EV7-1603	46	------	C	3	38	
5AM8	5.0	EV2-6319	7	------	D	3	25	Pentode sect.
5AM8	5.0	EV0-8070	0	70	A	2	40	Diode sect.
5AN8	5.0	EV8-6791	7	------	D	3	31	Pentode sect.
5AN8	5.0	EV2-1736	21	------	C	3	42	Triode sect.
5AQ5	5.0	ET1-5620	21	------	C	3	46	
5AR4	5.0	JS0-6000	0	70	A	7	40	Plate No. 1.
5AR4	5.0	JS0-4000	0	70	A	7	40	Plate No. 2.
5AS4	5.0	JS0-6000	0	47	A	7	40	Plate No. 1.
5AS4	5.0	JS0-4000	0	42	A	7	40	Plate No. 2.
5AS8	5.0	EV2-9137	11	------	D	3	28	Pentode sect.
5AS8	5.0	EV0-6087	0	70	A	2	40	Diode sect.
5AT8	5.0	EV9-6738	9	------	D	3	23	Pentode sect.
5AT8	5.0	EV1-2038	15	------	D	3	23	Triode sect.
5AU4	5.0	JS0-6000	0	58	A	7	40	Plate No. 1.
5AU4	5.0	JS0-4000	0	53	A	7	40	Plate No. 2.
5AV8	5.0	EV6-9870	7	------	D	3	31	Pentode sect.
5AV8	5.0	EV2-3010	21	------	C	3	42	Triode sect.
5AW4	5.0	JS0-6004	0	50	A	7	40	Plate No. 1.
5AW4	5.0	JS0-4006	0	45	A	7	40	Plate No. 2.
5AX4	5.0	JS0-6000	0	0	A	7	40	Plate No. 1.
5AX4	5.0	JS0-4000	0	0	A	7	40	Plate No. 2.
5AZ4	5.0	JS0-4006	0	0	A	7	40	Plate No. 1.
5AZ4	5.0	JS0-6004	0	0	A	7	40	Plate No. 2.
5B8	5.0	EV6-9871	7	------	D	3	31	Pentode sect.
5B8	5.0	EV2-3019	24	------	C	3	42	Triode sect.
5BE8	5.0	EV9-6783	20	------	B	3	57	Pentode sect. Short on 2 and 3.
5BE8	5.0	EV1-2030	16	------	C	3	57	Triode sect.
5BK7A	5.0	EV7-6089	8	------	D	3	43	Triode No. 1.
5BK7A	5.0	EV2-1039	8	------	D	3	43	Triode No. 2.
5BQ7A	5.0	EV7-6089	14	------	D	3	32	Triode No. 1.
5BQ7A	5.0	EV2-1039	14	------	D	3	32	Triode No. 2.
5BR8	5.0	EV9-6780	15	------	B	3	57	Pentode sect.
5BR8	5.0	EV1-2030	16	------	C	3	57	Triode sect.
5BS8	5.0	EV7-6089	17	------	D	3	36	Triode No. 1.
5BS8	5.0	EV2-1039	17	------	D	3	36	Triode No. 2.
5BT8	5.0	EV8-6790	11	------	D	3	28	Pentode sect.
5BT8	5.0	EV0-1030	0	50	A	2	40	Diode No. 1.
5BT8	5.0	EV0-2030	0	50	A	2	40	Diode No. 2.
5BW8	5.0	EV6-9870	15	------	B	3	57	Pentode sect.
5BW8	5.0	EV0-3020	0	70	A	2	40	Diode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5BW8	5.0	EV0-1020	0	70	A	2	40	Diode No. 2.
5BZ7	5.0	EV7-6089	17	------	D	3	34	Triode No. 1.
5BZ7	5.0	EV2-1039	17	------	D	3	34	Triode No. 2.
5CG8	5.0	EV9-6780	9	------	D	3	23	Pentode sect.
5CG8	5.0	EV1-2030	15	------	D	3	23	Triode sect.
5CL8	5.0	EV9-6780	8	------	D	3	20	Tetrode sect.
5CL8	5.0	EV1-2030	12	------	D	3	35	Triode sect.
5CM6	5.0	EV3-9170	21	------	C	3	46	
5CM8	5.0	EV2-6730	11	------	D	3	28	Pentode sect.
5CM8	5.0	EV9-1080	18	------	B	3	25	Triode sect.
5CQ8	5.0	EV2-6370	18	------	C	3	38	Tetrode sect.
5CQ8	5.0	EV9-1080	22	------	C	3	44	Triode sect.
5CU4	5.0	JS0-6010	0	70	A	7	32	Plate No. 1.
5CU4	5.0	JS0-4010	0	70	A	7	32	Plate No. 2.
5CZ5	5.0	EV3-9170	15	------	C	3	60	
5DH8	5.0	EV9-6738	10	------	D	3	26	Pentode sect.
5DH8	5.0	EV1-2030	27	------	B	3	47	Triode sect.
5DJ4	5.0	JS0-6000	0	50	A	7	40	Plate No. 1.
5DJ4	5.0	JS0-4000	0	44	A	7	40	Plate No. 2.
5EA8	5.0	EV2-6370	0	------	D	3	28	Pentode sect.
5EA8	5.0	EV9-1080	10	------	D	3	46	Triode sect.
5EH8	5.0	EV7-9860	22	------	B	3	53	Pentode sect.
5EH8	5.0	EV2-3010	24	------	C	3	51	Triode sect.
5ES8	5.0	EV7-6080	20	------	D	3	50	Triode No. 1.
5ES8	5.0	EV2-1030	20	------	D	3	50	Triode No. 2.
5EU8	5.0	EV7-1980	0	------	D	3	28	Pentode sect.
5EU8	5.0	EV2-3060	10	------	D	3	46	Triode sect.
5EW6	5.0	ET1-5627	26	------	B	3	52	
5FG7	5.0	EV9-6780	19	------	C	3	36	Pentode sect.
5FG7	5.0	EV1-2030	29	------	C	3	35	Triode sect.
5FV8	5.0	EV9-6780	10	------	C	3	50	Pentode sect.
5FV8	5.0	EV1-2030	16	------	D	3	38	Triode sect.
5GH8	5.0	EV2-6370	19	------	C	3	38	Pentode sect.
5GH8	5.0	EV9-1080	13	------	D	3	42	Triode sect.
5J6	5.0	ET5-2070	18	------	D	3	23	Triode No. 1.
5J6	5.0	ET6-1070	15	------	D	3	23	Triode No. 2.
5R4	5.0	JS0-6000	0	39	A	7	40	Plate No. 1.
5R4	5.0	JS0-4000	0	36	A	7	40	Plate No. 2.
5T4	5.0	JS0-6000	0	54	A	7	40	Plate No. 1.
5T4	5.0	JS0-4000	0	47	A	7	40	Plate No. 2.
5T8	5.0	EV8-9076	11	------	B	3	30	Triode sect.
5T8	5.0	EV0-6071	0	70	A	2	40	Diode No. 1.
5T8	5.0	EV0-2036	0	70	A	2	40	Diode No. 2.
5T8	5.0	EV0-1078	0	70	A	2	40	Diode No. 3.
5U4	5.0	JS0-6000	0	47	A	7	40	Plate No. 1.
5U4	5.0	JS0-4000	0	42	A	7	40	Plate No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5U8	5.0	EV2-6370	15	------	B	3	57	Pentode sect.
5U8	5.0	EV9-1080	16	------	C	3	57	Triode sect.
5V3	5.0	JS0-6004	0	58	A	7	40	Plate No. 1.
5V3	5.0	JS0-4006	0	53	A	7	40	Plate No. 2.
5V4	5.0	JS0-6000	0	60	A	7	40	Plate No. 1.
5V4	5.0	JS0-4000	0	60	A	7	40	Plate No. 2.
5V6	5.0	HS5-3481	21	------	C	3	46	
5W4	5.0	JS0-6000	0	16	A	7	40	Plate No. 1.
5W4	5.0	JS0-4000	0	0	A	7	40	Plate No. 2.
5X3	5.0	ER0-3000	0	0	A	7	40	Plate No. 1.
5X3	5.0	ER0-2000	0	0	A	7	40	Plate No. 2.
5X4	5.0	HY0-5000	0	47	A	7	40	Plate No. 1.
5X4	5.0	HY0-3000	0	42	A	7	40	Plate No. 2.
5X8	5.0	EV7-9861	9	------	D	3	23	Pentode sect
5X8	5.0	EV2-3861	15	------	D	3	23	Triode sect.
5Y3	5.0	JS0-6000	0	0	A	7	40	Plate No. 1.
5Y3	5.0	JS0-4000	0	0	A	7	40	Plate No. 2.
5Y4	5.0	HY0-5000	0	0	A	7	40	Plate No. 1.
5Y4	5.0	HY0-3000	0	0	A	7	40	Plate No. 2.
5Z3	5.0	ER0-3000	0	47	A	7	40	Plate No. 1.
5Z3	5.0	ER0-2000	0	42	A	7	40	Plate No. 2.
5Z4	5.0	JS0-6000	0	64	A	7	40	Plate No. 1.
5Z4	5.0	JS0-4000	0	64	A	7	40	Plate No. 2.
6A3	6.3	ER3-2000	67	------	C	3	38	
6A4	6.3	FR3-2400	28	------	B	3	50	
6A5	6.3	HS5-3000	67	------	C	3	38	
6A6	6.3	HR5-6040	12	------	B	3	38	Triode No. 1.
6A6	6.3	HR3-2040	12	------	B	3	38	Triode No. 2.
6A7	6.3	HR5-3462	41	------	B	3	29	Cap connects to grid No. 4.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6A8	6.3	HS5-4683	41	——	B	3	29	Cap connects to grid No. 4.
6AB4	6.3	ET6-1070	10	——	C	3	50	
6AB5	6.3	GR6-4030	0	100	A	3	——	Eye open.
6AB5	6.3	GR5-4230	0	100	A	3	——	Eye closed.
6AB6	6.3	HS5-3480	0	——	B	3	37	
6AB7	6.3	HS4-8653	0	——	C	3	44	
6AB8	6.3	EV9-6837	24	——	C	3	35	Pentode sect.
6AB8	6.3	EV2-1030	35	——	B	3	20	Triode sect.
6AC5	6.3	HS5-3080	0	——	B	3	21	
6AC6	6.3	HS5-3480	0	——	B	3	60	
6AC7	6.3	HS4-8653	10	——	D	3	80	
6AD4*	6.3	DU2-1050	28	——	B	3	18	C basing.
6AD4*	6.3	DW1-8050	28	——	B	3	18	F basing.
6AD6	6.3	HS4-3580	0	100	A	3	——	Eye 1 open. Eye 2 closed.
6AD6	6.3	HS3-4580	0	100	A	3	——	Eye 2 open. Eye 1 closed.
6AD7	6.3	HS5-3486	29	——	B	3	50	Pentode sect.
6AD7	6.3	HS1-6083	0	——	B	3	15	Triode sect.
6AE5	6.3	HS5-3080	68	——	B	3	80	
6AE6	6.3	HS5-4083	0	——	B	3	22	Triode No. 1.
6AE6	6.3	HS5-3084	0	——	B	3	19	Triode No. 2.
6AE7	6.3	HS6-3084	33	——	B	3	38	Triode No. 1.
6AE7	6.3	HS4-3056	33	——	B	3	38	Triode No. 2.
6AF3	6.3	EV0-0820	0	38	A	(#)	60	Cap connects to plate.
#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.								
6AF4	6.3	ET2-1050	36	——	D	3	23	
6AF5	6.3	HS5-3080	51	——	B	3	38	
6AF6	6.3	HS4-3580	0	100	A	3	——	Eye 1 open. Eye 2 closed.
6AF6	6.3	HS3-4580	0	100	A	3	——	Eye 2 open. Eye 1 closed.
6AG5	6.3	ET1-5620	10	——	D	3	20	
6AG7	6.3	HS4-8651	10	——	D	3	30	
6AH4	6.3	HS1-5080	47	——	C	3	57	
6AH5	6.3	HS6-4180	23	——	D	3	25	
6AH6	6.3	ET1-5672	10	——	D	3	30	
6AH7	6.3	HY5-6043	20	——	B	3	50	Triode No. 1.
6AH7	6.3	HY1-3026	20	——	B	3	50	Triode No. 2.
6AJ4	6.3	JX1-5020	9	——	D	3	50	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6AJ5	6.3	ET1-5620	12	———	D	(#)	14	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6AJ7	6.3	HS4-8653	10	———	D	3	30	
6AJ8	6.3	EV2-6137	13	———	B	3	50	Tetrode sect.
6AJ8	6.3	EV9-8036	26	———	B	3	50	Triode sect.
6AK4*	6.3	DW1-8057	24	———	D	3	19	F basing.
6AK5	6.3	ET1-5620	10	———	D	3	22	
6AK6	6.3	ET1-5672	23	———	B	3	53	
6AK7	6.3	HS4-8651	10	———	D	3	30	
6AK8	6.3	EV8-9070	11	———	B	3	30	Triode sect.
6AK8	6.3	EV0-6070	0	0	A	2	40	Diode No. 1.
6AK8	6.3	EV0-2030	0	70	A	2	40	Diode No. 2.
6AK8	6.3	EV0-1070	0	70	A	2	40	Diode No. 3.
6AL3	6.3	EV0-0090	0	74	A	(#)	36	Cap connects to plate.
#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.								
6AL5	6.3	ET0-7010	0	70	A	2	40	Diode No. 1.
6AL5	6.3	ET0-2050	0	70	A	2	40	Diode No. 2.
6AL6	6.3	HS5-0480	23	———	D	3	25	Cap connects to plate.
6AL7	6.3	HS6-3580	Vary	100	A	3	———	Bias controls left pattern.
6AL7	6.3	HS5-3480	Vary	100	A	3	———	Bias controls both patterns.
6AL7	6.3	HS4-3580	Vary	100	A	3	———	Bias controls right pattern.
6AM4	6.3	JX1-5020	10	———	D	3	35	
6AM5	6.3	ET1-5720	27	———	C	3	33	
6AM6	6.3	ET1-5726	10	———	D	3	25	
6AM8	6.3	EV2-6319	7	———	D	3	25	Pentode sect.
6AM8	6.3	EV0-8070	0	70	A	2	40	Diode sect.
6AN4	6.3	ET2-1050	6	———	D	3	40	
6AN5	6.3	ET1-5670	0	———	D	(#)	30	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6AN6	6.3	HR0-5060	0	25	A	2	40	Diode No. 1.
6AN6	6.3	HR0-4060	0	25	A	2	40	Diode No. 2.
6AN6	6.3	HR0-3060	0	25	A	2	40	Diode No. 3.
6AN6	6.3	HR0-2060	0	25	A	2	40	Diode No. 4.
6AN8	6.3	EV8-6791	7	———	D	3	31	Pentode sect.
6AN8	6.3	EV2-1736	21	———	C	3	42	Triode sect.
6AQ4	6.3	ET1-7050	10	———	D	3	41	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6AQ5	6.3	ET1-5620	21	------	C	3	46	
6AQ6	6.3	ET1-7020	6	------	B	3	29	Triode sect.
6AQ6	6.3	ET0-6020	0	0	A	2	40	Diode No. 1.
6AQ6	6.3	ET0-5020	0	0	A	2	40	Diode No. 2.
6AQ7	6.3	HY4-5026	13	------	B	3	25	Triode sect.
6AQ7	6.3	HY4-1026	0	30	A	2	40	Diode No. 1.
6AQ7	6.3	HY4-3026	0	30	A	2	40	Diode No. 2.
6AQ8	6.3	EV7-6089	10	------	C	3	50	Triode No. 1.
6AQ8	6.3	EV2-1039	10	------	C	3	50	Triode No. 2.
6AR5	6.3	ET1-5620	34	------	B	3	40	
6AR6	6.3	GY7-3510	34	------	D	3	27	
6AR8	6.3	EV6-9372	25	------	B	3	35	Plate No. 1.
6AR8	6.3	EV6-8372	25	------	B	3	35	Plate No. 2.
6AR11	6.3	BS4-8937	12	------	C	3	51	Pentode No. 1. (#)
	#Use Hickok Adapter Model 1704. Set Adapter Selectors to 4-3-2.							
6AR11	6.3	BX5-2364	12	------	C	3	51	Pentode No. 2. (#)
	#Use Hickok Adapter Model 1704. Set Adapter Selectors to 0-0-7.							
6AS5	6.3	ET2-7610	25	------	D	3	28	
6AS6	6.3	ET1-5627	14	------	B	3	44	
6AS7	6.3	HY4-5062	100	------	C	3	36	Triode No. 1.
6AS7	6.3	HY1-2035	100	------	C	3	36	Triode No. 2.
6AS8	6.3	EV2-9137	11	------	D	3	28	Pentode sect.
6AS8	6.3	EV0-6087	0	70	A	2	40	Diode sect.
6AT6	6.3	ET1-7020	18	------	B	3	30	Triode sect.
6AT6	6.3	ET1-6020	0	0	A	2	40	Diode No. 1.
6AT6	6.3	ET1-5020	0	0	A	2	20	Diode No. 2.
6AT8	6.3	EV9-6738	9	------	D	3	23	Pentode sect.
6AT8	6.3	EV1-2038	15	------	D	3	23	Triode sect.
6AU4	6.3	HY0-5030	0	66	A	7	40	
6AU5	6.3	HS1-5830	41	------	C	3	36	
6AU6	6.3	ET1-5672	16	------	B	3	58	
6AU7	6.3	EV7-6080	24	------	B	3	56	Triode No. 1.
6AU7	6.3	EV2-1030	24	------	B	3	56	Triode No. 2.
6AU8	6.8	EV7-9860	10	------	D	3	30	Pentode sect.
6AU8	6.3	EV2-3010	9	------	D	3	25	Triode sect.
6AV5	6.3	HS1-5830	50	------	C	3	49	
6AV6	6.3	ET1-7025	12	------	B	3	32	Triode sect.
6AV6	6.3	ET1-6025	0	0	A	2	40	Diode No. 1.
6AV6	6.3	ET1-5027	0	0	A	2	40	Diode No. 2.
6AW7	6.3	HY2-6010	8	------	B	3	23	Triode sect.
6AW7	6.3	HY2-3050	0	65	A	2	40	Diode No. 1.
6AW7	6.3	HY2-4010	0	65	A	2	40	Diode No. 2.
6AW8	6.3	EV7-9863	14	------	D	3	38	Pentode sect.
6AW8	6.3	EV2-3019	9	------	D	3	20	Triode sect.
6AX4	6.3	HY0-5030	0	54	A	7	40	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6AX5	6.3	HS0-5083	0	12	A	7	40	Plate No. 1.
6AX5	6.3	HS0-3085	0	12	A	7	40	Plate No. 2.
6AX6	6.3	HS0-5080	0	65	A	7	40	Plate No. 1.
6AX6	6.3	HS0-3040	0	65	A	7	40	Plate No. 2.
6AX7	6.3	EV7-6080	12	------	B	3	32	Triode No. 1
6AX7	6.3	EV2-1030	12	------	B	3	32	Triode No. 2.
6AX8	6.3	EV2-6370	15	------	B	3	57	Pentode sect.
6AX8	6.3	EV9-1080	16	------	C	3	57	Triode sect.
6AZ5	6.3	DW0-8070	0	60	A	2	40	Diode No. 1.
6AZ5	6.3	DW0-1020	0	60	A	2	40	Diode No. 2.
6AZ6*	6.3	DW0-2048	0	65	A	2	40	F basing. Diode No.1
6AZ6*	6.3	DW0-7058	0	65	A	2	40	F basing. Diode No. 2
6AZ8	6.3	EV6-1230	7	------	D	3	30	Pentode sect.
6AZ8	6.3	EV9-8070	21	------	C	3	42	Triode sect.
6B4	6.3	HS5-3000	67	------	C	3	38	
6B5	6.3	GR4-2350	0	------	B	3	38	
6B6	6.3	HS0-3080	11	------	B	3	19	Triode sect. Cap connects to grid.
6B6	6.3	HS0-5080	0	14	A	2	40	Diode No. 1.
6B6	6.3	HS0-4080	0	14	A	2	40	Diode No. 2.
6B7	6.3	HR0-2360	30	------	B	3	25	Pentode sect. Cap connects to grid.
6B7	6.3	HR0-5360	0	14	A	2	40	Diode No. 1.
6B7	6.3	HR0-4360	0	14	A	2	40	Diode No. 2.
6B8	6.3	HS0-3681	24	------	B	3	29	Pentode sect. Cap connects to grid.
6B8	6.3	HS0-5681	0	14	A	2	40	Diode No. 1.
6B8	6.3	HS0-4681	0	14	A	2	40	Diode No. 2.
6B10	6.3	BV3-4020	29	------	C	3	28	Triode No. 1 (#).
#Use Hickok Adapter Model 1704. Set Adapter Selectors to 0-0-5.								
6B10	6.3	BS5-6070	29	------	C	3	28	Triode No. 2 (#).
#Set Adapter Selectors to 0-0-2.								
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No. 1 (#).
#Set Adapter Selectors to 0-0-2.								
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No. 2 (#).
#Set Adapter Selectors to 8-0-2.								
6BA5*	6.3	DW1-5780	16	------	B	3	54	F basing.
6BA6	6.3	ET1-5672	9	------	C	3	41	
6BA7	6.3	EV7-9136	Short test only.					
6BA7	6.3	EV2-1037	10	------	D	3	40	
6BA8	6.3	EV7-9860	11	------	D	3	30	Pentode sect.
6BA8	6.3	EV2-3010	29	------	C	3	34	Triode sect.
6BC4	6.3	EV2-1060	10	------	D	3	50	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6BC5	6.3	ET1-5620	0	------	C	3	40	
6BC7	6.3	EV0-8090	0	71	A	2	40	Diode No. 1.
6BC7	6.3	EV0-6070	0	71	A	2	40	Diode No. 2.
6BC7	6.3	EV0-2010	0	71	A	2	40	Diode No. 3.
6BC8	6.3	EV7-6089	15	------	D	3	31	Triode No. 1.
6BC8	6.3	EV2-1039	15	------	D	3	31	Triode No. 2.
6BD5	6.3	HS1-5830	18	------	D	3	25	
6BD6	6.3	ET1-5672	19	------	B	3	50	
6BD11	6.3	BS6-8050	29	------	B	3	38	Triode No. 1 (#).
#Set Adapter Selectors to 0-0-2.								
6BD11	6.3	BS3-4070	24	------	B	3	54	Triode No. 2 (#).
#Set Adapter Selectors to 0-0-2.								
6BD11	6.3	BT5-2490	27	------	C	3	38	Pentode sect. (#).
#Use Hickok Adapter Model 1704. Set Adapter Selectors to 4-5-3.								
6BE6	6.3	ET7-5621	Short test only.					
6BE6	6.3	ET1-6027	17	------	D	3	36	
6BE7	6 3	EV7-1639	29	------	B	3	25	
6BE8	6.3	EV9-6783	20	------	B	3	57	Pentode sect. Short on 2 and 3.
6BE8	6.3	EV1-2030	16	------	C	3	57	Triode sect.
6BF5	6.3	ET1-5620	49	------	C	3	43	
6BF6	6.3	ET1-7020	18	------	B	3	48	Triode sect.
6BF6	6.3	ET1-6020	0	0	A	2	40	Diode No. 1.
6BF6	6.3	ET1-5020	0	0	A	2	40	Diode No. 2.
6BF7*	6.3	DW7-8050	22	------	C	3	31	F basing. Triode No. 1.
6BF7*	6.3	DW2-1040	22	------	C	3	31	F basing. Triode No.2.
6BF11	6.3	BS8-3490	31	------	D	3	33	Pentode No. 1 (#).
#Use Hickok Adapter Model 1704. Set Adapter Selectors to 4-3-2.								
6BF11	6.3	BY3-7625	26	------	B	3	10	Pentode No. 2 (#).
#Set Adapter Selectors to 0-0-8.								
6BG6	6.3	HS5-0830	18	------	D	3	30	Cap connects to plate.
6BG7*	6.3	DW7-8050	22	------	C	3	31	F basing. Triode No. 1.
6BG7*	6.3	DW2-1040	22	------	C	3	31	F basing. Triode No. 2.
6BH6	6.3	ET1-5627	15	------	B	3	50	
6BH8	6.3	EV7-9860	8	------	D	3	30	Pentode sect.
6BH8	6.3	EV2-3010	29	------	C	3	42	Triode sect.
6BJ6	6.3	ET1-5627	0	------	C	3	48	
6BJ7	6.3	EV0-8093	0	71	A	2	40	Diode No. 1.
6BJ7	6.3	EV0-6073	0	71	A	2	40	Diode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6BU6	6.3	ET1-6020	0	40	A	2	40	Diode No. 1.
6BU6	6.3	ET1-5020	0	40	A	2	40	Diode No. 2.
6BU8	6.3	EV7-8219	0	------	B	3	33	Pentode No. 1.
6BU8	6.3	EV7-3216	0	------	B	3	33	Pentode No. 2.
6BV8	6.3	EV2-3010	18	------	D	3	28	Triode sect.
6BV8	6.3	EV0-9070	0	70	A	2	40	Diode No. 1.
6BV8	6.3	EV0-6080	0	70	A	2	40	Diode No. 2.
6BW4	6.3	EV0-7091	0	15	A	7	40	Plate No. 1.
6BW4	6.3	EV0-1097	0	15	A	7	40	Plate No. 2.
6BW6	6.3	EV2-7839	21	------	C	3	46	
6BW8	6.3	EV6-9870	15	------	B	3	57	Pentode sect.

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Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6BJ7	6.3	EV0-2013	0	71	A	2	40	Diode No. 3.
6BJ8	6.3	EV8-7090	24	------	C	3	35	Triode sect.
6BJ8	6.3	EV0-6030	0	70	A	2	40	Diode No. 1.
6BJ8	6.3	EV0-1020	0	70	A	2	40	Diode No. 2.
6BK5	6.3	EV3-1860	0	------	D	3	28	
6BK6	6.3	ET1-7025	6	------	B	3	32	Triode sect.
6BK6	6.3	ET0-6025	0	40	A	2	40	Diode No. 1.
6BK6	6.3	ET0-5027	0	40	A	2	40	Diode No. 2
6BK7	6.3	EV7-6089	8	------	D	3	43	Triode No. 1.
6BK7	6.3	EV2-1039	8	------	D	3	43	Triode No. 1.
6BL4	6.3	HY0-1030	0	69	A	7	40	
6BL7	6.3	HY1-2030	24	------	D	3	25	Triode No. 1.
6BL7	6.3	HY4-5060	24	------	D	3	25	Triode No. 2.
6BL8	6.3	EV2-6371	19	------	C	3	34	Pentode sect.
6BL8	6.3	EV9-1086	34	------	C	3	36	Triode sect.
6BM8	6.3	EV3-6720	32	------	C	3	56	Pentode sect.
6BM8	6.3	EV1-9080	14	------	B	3	41	Triode sect.
6BN4	6.3	ET2-5010	15	------	D	3	34	
6BN4A	6.3	ET2-5010	20	------	D	3	32	
6BN6	6.3	ET2-7516	0	------	B	3	18	Limiter grid.
6BN6	6.3	ET6-7512	0	------	B	3	23	Quadrature grid.
6BN8	6.3	EV8-7090	15	------	D	3	13	Triode sect.
6BN8	6.3	EV0-6030	0	70	A	2	40	Diode No. 1.
6BN8	6.3	EV0-1020	0	70	A	2	40	Diode No. 2.
6BQ5	6.3	EV2-7930	30	------	C	3	50	
6BQ6	6.3	HS5-0480	50	------	C	3	56	Cap connects to plate.
6BQ7	6.3	EV7-6080	17	------	D	3	26	Triode No. 1.
6BQ7	6.3	EV2-1030	17	------	D	3	26	Triode No. 2.
6BQ7A	6.3	EV7-6089	14	------	D	3	32	Triode No. 1.
6BQ7A	6.3	EV2-1039	14	------	D	3	32	Triode No. 2.
6BR5	6.3	EV1-9020	60	------	D	3	------	Eye open.
6BR5	6.3	EV1-9020	10	------	D	3	------	Eye closed.
6BR7	6.3	EV2-7839	28	------	B	3	26	
6BR8	6.3	EV9-6780	15	------	B	3	57	Pentode sect.
6BR8	6.3	EV1-2030	16	------	C	3	57	Triode sect.
6BS7	6.3	EV0-7839	28	------	B	3	26	Cap connects to grid.
6BS8	6.3	EV7-6089	17	------	D	3	36	Triode No. 1.
6BS8	6.3	EV2-1039	17	------	D	3	36	Triode No. 2.
6BT6	6.3	ET1-7020	13	------	B	3	33	Triode sect.
6BT6	6.3	ET1-6020	0	40	A	2	40	Diode No. 1.
6BT6	6.3	ET1-5020	0	40	A	2	40	Diode No. 2.
6BT8	6.3	EV8-6790	11	------	D	3	28	Pentode sect.
6BT8	6.3	EV0-1030	0	50	A	2	40	Diode No. 1.
6BT8	6.3	EV0-2030	0	50	A	2	40	Diode No. 2.
6BU6	6.3	ET1-7020	34	------	B	3	38	Triode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6BW8	6.3	EV0–3020	0	70	A	2	40	Diode No. 1.
6BW8	6.3	EV0–1020	0	70	A	2	40	Diode No. 2.
6BX6	6.3	EV2–7819	13	———	C	3	38	
6BX7	6.3	HY4–5062	33	———	D	3	38	Triode No. 1.
6BX7	6.3	HY1–2035	33	———	D	3	38	Triode No. 2.
6BX8	6.3	EV7–6089	24	———	D	3	25	Triode No. 1.
6BX8	6.3	EV2–1039	24	———	D	3	25	Triode No. 2.
6BY5	6.3	HS0–4010	0	50	A	7	40	Plate No. 1.
6BY5	6.3	HS0–5080	0	50	A	7	40	Plate No. 2.
6BY6	6.3	ET1–5627	21	———	B	3	30	Grid No. 1.
6BY6	6.3	ET7–5621	21	———	B	(#)	13	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6BY7	6.3	EV2–7819	14	———	D	3	23	
6BY8	6.3	EV1–7892	16	———	B	3	58	Pentode sect.
6BY8	6.3	EV0–6030	0	70	A	2	40	Diode sect.
6BZ6	6.3	ET1–5627	20	———	C	3	32	
6BZ7	6.3	EV7–6089	17	———	D	3	34	Triode No. 1.
6BZ7	6.3	EV2–1039	17	———	D	3	34	Triode No. 2.
6BZ8	6.3	EV7–6089	16	———	D	3	30	Triode No. 1.
6BZ8	6.3	EV2–1039	16	———	D	3	30	Triode No. 2.
6C4	6.3	ET6–1070	24	———	B	3	55	
6C5	6.3	HS5–3080	21	———	B	3	50	
6C6	6.3	GR0–2354	21	———	B	3	31	Cap connects to grid.
6C7	6.3	HR0–2060	29	———	B	3	31	Triode Sect. Cap connects to grid.
6C7	6.3	HR0–5060	0	0	A	2	40	Diode No. 1.
6C7	6.3	HR0–4060	0	0	A	2	40	Diode No. 2.
6C8	6.3	HS5–6080	17	———	B	3	25	Triode No. 1.
6C8	6.3	HS0–3040	17	———	B	3	25	Triode No. 2. Cap connects to grid.
6CA4	6.3	EV0–7030	0	59	A	7	40	Plate No. 1.
6CA4	6.3	EV0–1030	0	59	A	7	40	Plate No. 2.
6CA5	6.3	ET2–7610	25	———	D	3	30	
6CA7	6.3	HS5–3481	25	———	D	3	30	
6CB5	7.5	HS4–0130	39	———	D	3	35	Cap = P.
6CB6	6.3	ET1–5627	11	———	D	3	28	
6CD6	6.3	HS5–0830	42	———	D	3	33	Cap connects to plate.
6CD7	6.3	HS4–5080	(#)	100	E	4	———	

#Connect a 1-megohm resistor from the plate jack to pin No. 3 of large 7 pin socket. Connect another 1-megohm resistor from plate jack to pin 6 of large 7 pin socket. Eye 1 closes at a bias of about 30. Eye 2 closes at a bias of about 55.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6CE5	6.3	ET1-5620	11	———	D	3	28	
6CF6	6.3	ET1-5627	11	———	D	3	28	
6CG7	6.3	EV7-6089	23	———	B	3	50	Triode No. 1.
6CG7	6.3	EV2-1039	23	———	B	3	50	Triode No. 2.
6CG8	6.3	EV9-6780	9	———	D	3	23	Pentode sect.
6CG8	6.3	EV1-2030	15	———	D	3	23	Triode sect.
6CH6	6.3	EV2-7839	0	———	D	3	46	
6CH7	6.3	EV7-6080	17	———	D	3	34	Triode No. 1.
6CH7	6.3	EV2-1030	17	———	D	3	34	Triode No. 2.
6CH8	6.3	EV7-2360	7	———	D	3	31	Pentode sect.
6CH8	6.3	EV8-9010	21	———	C	3	42	Triode sect.
6CJ6	6.3	EV2-0731	54	———	C	3	58	Cap connects to grid.
6CK4	6.3	HS1-5080	56	———	C	3	50	
6CK6	6.3	EV2-7136	5	———	D	3	50	
6CL5	6.3	HS5-0160	53	———	D	3	80	Cap connects to plate.
6CL6	6.3	EV2-6317	10	———	D	3	30	
6CL8	6.3	EV9-6780	8	———	D	3	20	Tetrode sect.
6CL8	6.3	EV1-2030	12	———	D	3	35	Triode sect.
6CM4	6.3	EV2-1030	15	———	D	3	50	
6CM5	6.3	HS5-0480	35	———	D	3	48	Cap connects to plate.
6CM6	6.3	EV3-9170	21	———	C	3	46	
6CM7	6.3	EV7-6030	25	———	B	3	50	Triode No. 1.
6CM7	6.3	EV8-1090	22	———	D	3	22	Triode No. 2.
6CM8	6.3	EV2-6730	11	———	D	3	28	Pentode sect.
6CM8	6.3	EV9-1080	18	———	B	3	25	Triode sect.
6CN6	6.3	HS5-0481	0	———	E	3	32	Cap connects to plate.
6CN7	6.3	EV7-8060	11	———	B	3	30	Triode sect.
6CN7	6.3	EV0-2030	0	70	A	2	40	Diode No. 1.
6CN7	6.3	EV0-1030	0	70	A	2	40	Diode No. 2.
6CQ4	6.3	HY0-5030	0	38	A	7	50	
6CQ8	6.3	EV2-6370	18	———	C	3	38	Tetrode sect.
6CQ8	6.3	EV9-1080	22	———	C	3	44	Triode sect.
6CR6	6.3	ET7-5612	12	———	B	3	49	Pentode sect.
6CR6	6.3	ET0-2010	0	14	A	2	40	Diode sect.
6CR8	6.3	EV2-6783	18	———	C	3	31	Pentode sect.
6CR8	6.3	EV9-1080	18	———	C	3	50	Triode sect.
6CS6	6.3	ET1-5627	20	———	B	(#)	8	Grid No. 1.
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
6CS6	6.3	ET7-5621	0	———	B	(#)	12	Grid No. 3.
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
6CS7	6.3	EV7-6080	17	———	C	3	28	Triode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6CS7	6.3	EV3-1090	28	———	D	3	23	Triode No. 2.
6CU5	6.3	ET2-7610	10	———	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6CU6	6.3	HS5-0480	50	———	C	3	56	Cap connects to plate.
6CU8	6.3	EV7-2361	7	———	D	3	31	Pentode sect.
6CU8	6.3	EV8-9010	21	———	C	3	42	Triode sect.
6CW4	6.3	DR4-2080	16	———	D	3	44	Use Hickok adapter. Code No. 1050-127.
6CW5	6.3	EV2-7930	9	———	D	3	50	
6CW7	6.3	EV6-9010	25	———	D	3	30	Triode No. 1.
6CW7	6.3	EV2-3010	25	———	D	3	30	Triode No. 2.
6CY5	6.3	ET1-5620	11	———	D	(#)	25	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6CX8	6.3	EV7-9800	11	———	D	3	31	Pentode sect.
6CX8	6.3	EV2-3010	26	———	C	3	25	Triode sect.
6CY7	6.3	EV7-6080	25	———	B	3	12	Triode No. 1.
6CY7	6.3	EV2-1090	65	———	C	3	50	Triode No. 2.
6CZ5	6.3	EV3-9170	15	———	C	3	60	
6D4	6.3	ET1-7050	(#)	62	A	7	40	
#Should strike between settings 87 and 77 of the BIAS dial.								
6D5	6.3	HS5-3080	57	———	B	3	50	
6D6	6.3	GR0-2354	21	———	B	3	40	Cap connects to grid.
6D7	6.3	HR0-2364	24	———	B	3	31	Cap connects to grid.
6D8	6.3	HS5-4683	45	———	B	3	31	Cap connects to grid.
6DA4	6.3	HY0-5030	0	34	A	7	52	
6DA5	6.3	EV1-5020	(#)	100	A	4	———	
#Connect a 1-megohm resistor from plate jack to octal test socket pin No. 7. Vary bias to vary beam angle.								
6DA6	6.3	EV2-7839	15	———	D	3	16	
6DA7	6.3	EV7-6080	23	———	C	3	32	Triode No. 1.
6DA7	6.3	EV3-1090	55	———	D	3	25	Triode No. 2.
6DB5	6.3	EV3-9120	10	———	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6DB6	6.3	ET1-5627	16	———	B	3	38	Grid No. 1.
6DB6	6.3	ET7-5621	14	———	B	(#)	15	Grid No. 2.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND								
6DC6	6.3	ET1-5627	11	———	D	3	28	
6DC8	6.3	EV2-6189	22	———	C	3	34	Pentode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6DC8	6.3	EVO-8030	0	13	A	2	28	Diode No. 1.
6DC8	6.3	EVO-7030	0	13	A	2	28	Diode No. 2.
6DE4	6.3	HYO-5030	0	38	A	7	50	
6DE6	6.3	ET1-5627	11	------	D	3	28	
6DE7	6.3	EV7-6080	31	------	B	3	51	Triode No. 1.
6DE7	6.3	EV2-1090	54	------	D	3	33	Triode No. 2.
6DG7	6.3	HS5-3480	10	------	D	(#)	40	
6DG7	6.3	EV2-7839	9	------	C	3	41	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6DJ8	6.3	EV7-6080	20	------	D	3	62	Triode No. 1.
6DJ8	6.3	EV2-1030	20	------	D	3	62	Triode No. 2
6DK6	6.3	ET1-5627	8	------	D	3	33	
6DL5	6.3	ET1-5620	12	------	C	3	53	
6DM4	6.3	HYO-5030	0	38	A	7	50	
6DN6	6.3	HS5-0830	28	------	D	(#)	45	Cap connects to plate.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6DN7	6.3	HY4-5060	31	------	B	3	40	Triode No. 1.
6DN7	6.3	HY1-2030	26	------	D	3	40	Triode No. 2.
6DQ5	6.3	HS1-0430	53	------	D	3	34	Cap is the plate.
6DQ6	6.3	HS5-0480	36	------	D	3	30	Cap connects to plate.
6DR7	6.3	EV7-6080	22	------	B	3	20	Triode No. 1.
6DR7	6.3	EV2-1090	54	------	D	3	31	Triode No. 2.
6DS5	6.3	ET1-5620	16	------	D	3	30	
6DT5	6.3	EV3-9170	31	------	C	3	60	
6DT6	6.3	ET1-5627	22	------	B	3	15	Grid No. 1.
6DT6	6.3	ET7-5621	0	------	B	(#)	10	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6DT8	6.3	EV7-6089	10	------	C	3	50	Triode No. 1.
6DT8	6.3	EV2-1039	10	------	C	3	50	Triode No. 2.
6DW5	6.3	EV3-9170	50	------	C	3	56	
6DX8	6.3	EV8-6970	10	------	D	3	47	Pentode sect.
6DX8	6.3	EV1-2030	26	------	B	3	50	Triode sect.
6DZ7	6.3	HS5-6480	11	------	D	3	49	Pentode No. 1.
Connect negative (—) end of 30-volt battery to pin No. 1 of loctal socket (count counterclockwise).								
6DZ7	6.3	HS1-3480	11	------	D	3	49	Pentode No. 2.
Connect negative (—) end of 30-volt battery to pin No. 5 of loctal socket (counterclockwise). Connect positive end of 30-volt battery to pin No. 8 of loctal socket for each test.								
Caution: **Disconnect battery between selector changes.**								
6E5	6.3	GR5-4030	0	100	A	3	------	Eye open.
6E5	6.3	GR5-4230	0	100	A	3	------	Eye closed.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors.*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6E6	6.3	HR5-6040	54	------	B	3	35	Triode No. 1.
6E6	6.3	HR3-2040	54	------	B	3	35	Triode No. 2.
6E7	6.3	HR0-2364	24	------	B	3	38	Cap connects to grid.
6EA5	6.3	ET1-5020	10	------	D	3	26	
6EA7	6.3	JX4-5060	10	------	B	3	39T	Triode No. 1.
6EA7	6.3	JX1-2030	56	------	D	3	33	Triode No. 2.
6EA8	6.3	EV2-6370	0	------	D	3	28	Pentode sect.
6EA8	6.3	EV9-1080	10	------	D	3	46	Triode No. 1.
6EB5	6.3	ET0-2056	0	21	A	2	40	Diode No. 1.
6EB5	6.3	ET0-7016	0	21	A	2	40	Diode No. 2.
6EB8	6.3	EV7-9860	0	------	D	3	46	Pentode sect.
6EB8	6.3	EV2-3010	19	------	B	3	38	Triode sect.
6EH5	6.3	ET2-7610	31	------	C	3	50	
6EH7	6.3	EV2-7819	10	------	D	3	65	
6EH8	6.3	EV7-9860	22	------	B	3	53	Pentode sect.
6EH8	6.3	EV2-3010	24	------	C	3	51	Triode sect.
6EJ7	6.3	EV2-7819	10	------	D	3	39	
6EM5	6.3	EV3-9170	23	------	D	3	25	
6EM7	6.3	HY4-5060	20	------	B	3	25	Triode No. 1.
6EM7	6.3	HY1-2030	60	------	D	3	35	Triode No. 2.
6EQ7	6.3	EV2-7631	29	------	B3	3	27	Pentode sect.
6EQ7	6.3	EV0-8030	0	0	A	2	34	Diode sect.
6ES5	6.3	ET2-5010	12	------	D	3	35	
6ES8	6.3	EV7-6080	20	------	D	3	50	Triode No. 1.
6ES8	6.3	EV2-1030	20	------	D	3	50	Triode No. 2.
6ET7	6.3	EV7-9860	10	------	D	3	38	Pentode sect.
6ET7	6.3	EV0-3010	0	0	A	2	20	Diode No. 1.
6ET7	6.3	EV0-2010	0	0	A	2	20	Diode No. 2.
6EU7	6.3	BS8-7090	12	------	B	3	32	Triode No. 1.
6EU7	6.3	BS5-6040	12	------	B	3	32	Triode No. 2.
6EU8	6.3	EV7-1980	0	------	D	3	28	Pentode sect.
6EU8	6.3	EV2-3060	10	------	D	3	46	Triode sect.
6EV5	6.3	ET1-5620	10	------	D	3	43	
6EV7	6.3	EV7-6080	10	------	C	3	43	Triode No. 1.
6EV7	6.3	EV2-1030	10	------	C	3	43	Triode No. 2.
6EW6	6.3	ET1-5627	26	------	B	3	52	
6EW7	6.3	EV7-6080	37	------	B	3	26	Triode No. 1.
6EW7	6.3	EV2-1090	54	------	D	3	38	Triode No. 2.
6EX6	6.3	HS5-0830	49	------	D	3	39	Cap connects to plate.
Tubes showing shorts: Retest using HS5-0130.								
6EY6	6.3	HS5-3480	33	------	C	3	55	
6EZ5	6.3	HS5-3480	48	------	B	3	50	
6EZ8	6.3	FU9-8000	36	------	B	3	34	Triode No. 1.
6EZ8	6.3	FU7-6000	36	------	B	3	34	Triode No. 2.
6EZ8	6.3	FU2-3010	29	------	B	3	34	Triode No. 3.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6F4	6.3	GR2-3070	30	------	D	3	30	
6F5	6.3	HS0-4081	12	------	B	3	25	Cap connects to grid.
6F6	6.3	HS5-3481	29	------	B	3	50	
6F7	6.3	HR0-2365	28	------	B	3	28	Pentode sect. Cap connects to grid.
6F7	6.3	HR5-4362	28	------	B	3	13	Triode sect.
6F8	6.3	HS5-6080	23	------	B	3	50	Triode No. 1.
6F8	6.3	HS0-3040	23	------	B	3	50	Triode No. 2. Cap connects to grid.
6FA7	6.3	EV7-9861	17	------	B	3	30	Tetrode No. 1.
6FA7	6.3	EV7-1869	17	------	B	3	80	Tetrode No. 1.
6FA7	6.3	EV9-3061	0	0	A	2	22	Diode sect.
6FD6	6.3	ET1-6572	20	20	A	2	44	Make no gas test.
6FE5	6.3	HS5-3480	45	------	D	3	33	
6FG5	6.3	ET1-5670	10	------	C	3	46	
6FG7	6.3	EV9-6780	19	------	C	3	36	Pentode sect.
6FG7	6.3	EV1-2030	29	------	C	3	35	Triode sect.
6FH5	6.3	ET2-5070	13	------	D	3	40	
6FH6	6.3	HS5-0480	36	------	3	3	30	
6FH8	6.3	FU6-9700	28	------	C	3	31	Tetrode plate No. 1.
6FH8	6.3	FU6-8700	23	------	B	3	31	Tetrode plate No. 2.
6FH8	6.3	FU6-1700	23	------	B	3	31	Tetrode plate No. 3.
6FH8	6.3	FU6-3000	32	------	D	3	29	Triode sect.
6FM8	6.3	EV8-9070	11	------	B	3	30	Triode sect.
6FM8	6.3	EV0-6010	0	70	A	2	40	Diode No. 1.
6FM8	6.3	EV0-2030	0	70	A	2	40	Diode No. 2.
6FQ5	6.3	ET2-5070	15	------	D	3	42	
6FQ5A	6.3	ET2-5070	15	------	D	3	50	
6FQ7	6.3	EV7-6080	23	------	B	3	50	Triode No. 1.
6FQ7	6.3	EV2-1030	23	------	B	3	50	Triode No. 2.
6FS5	6.3	ET1-5670	10	------	D	3	30	
6FV6	6.3	ET1-5672	22	------	C	3	40	
6FV8	6.3	EV9-6780	10	------	C	3	50	Pentode sect.
6FV8	6.3	EV1-2030	16	------	D	3	38	Triode sect.
6FW5	6.3	HS1-5830	48	------	D	3	57	
6FW8	6.3	EV7-6080	20	------	D	3	57	Triode No. 1.
6FW8	6.3	EV2-1030	20	------	D	3	57	Triode No. 2.
6FY5	6.3	ET2-5016	14	------	D	3	50	
6FY8	6.3	EV1-9080	30	------	B	3	23	Triode sect.
6G5	6.3	GR5-4030	0	100	A	3	------	Eye open.
6G5	6.3	GR5-4230	0	100	A	3	------	Eye closed.
6G6	6.3	HS5-3480	23	------	B	3	53	
6G7S	6.3	HR0-2354	86	------	B	3	38	Pentode sect. Cap connects to grid.
6G7S	6.3	HR0-4080	0	62	A	2	40	Diode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6G7S	6.3	HR0-6030	0	62	A	2	40	Diode No. 2.
6GC5	6.3	EV6-9170	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6GE8	6.3	EV8-9170	27	------	B	3	29	Pentode sect.
6GE8	6.3	EV3-6020	65	------	C	3	56	Triode sect.
6GH8	6.3	EV2-6370	19	------	C	3	38	Pentode sect.
6GH8	6.3	EV9-1080	13	------	D	3	42	Triode sect.
6GK5	6.3	ET2-5076	30	------	C	3	38	
6GK6	6.3	EV2-7813	10	------	D	3	47	
6GM5	6.3	EV6-9170	10	------	D	3	36	
6GM6	6.3	ET1-5627	10	------	D	3	38	
6GM8	6.3	EV7-6080	30	0	A	2	32	Triode No. 1. Make no gas test.
6GM8	6.3	EV2-1030	30	0	A	2	32	Triode No. 2. Make no gas test.
6GN8	6.3	EV7-9860	10	------	D	3	42	Pentode sect.
6GN8	6.3	EV2-3010	20	------	B	3	38	Triode sect.
6GS8	6.3	EV7-8219	0	------	B	3	28	Pentode No. 1.
6GS8	6.3	EV7-3216	0	------	B	3	28	Pentode No. 2.
6GW6	6.3	HS5-0480	34	------	D	(#)	38	Cap connects to plate.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
6GX6	6.3	ET1-5627	27	------	B	3	21	
6GY6	6.3	ET1-5627	28	------	B	3	20	
6GY8	OFF	EV0-6070				Short test only.		
6GY8	OFF	FU3-9080				Short test only.		
G5Y8	6.3	EV0-6070	0	55	A	2	40	Triode No. 1. Short on 3.
6GY8	6.3	FU3-9080	30	------	B	3	27	Triode No. 2. Short on 3.
6GY8	6.3	FU1-2000	37	------	B	3	27	Triode No. 3. No short.
6H4	6.3	HS0-4080	0	62	A	2	32	Diode.
6H5	6.3	GR5-4030	0	100	A	3	------	Eye open.
6H5	6.3	GR5-4230	0	100	A	3	------	Eye closed.
6H6	6.3	HS0-5080	0	63	A	2	40	Diode No. 1.
6H6	6.3	HS0-3040	0	63	A	2	40	Diode No. 2.
6H7M	6.3	HS5-3486	29	------	B	3	50	Pentode sect.
6H7M	6.3	HS0-6083	0	------	B	3	4	Triode sect. Cap connects to grid.
6HB6	6.3	EV2-7819	10	------	E	3	38	
6HF8	6.3	EV7-9860	10	------	D	3	35	Pentode sect.
6HF8	6.3	EV2-3010	30	------	B	3	25	Triode sect.
6HJ8	6.3	EV2-6319	21	------	C	3	34	Pentode sect.
6HJ8	6.3	EV0-8070	0	55	A	2	32	Diode sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6HS8	6.3	EV7-8219	10	------	B	3	20	Pentode No. 1.
6HS8	6.3	EV7-3216	10	------	B	3	20	Pentode No. 2.
6J4	6.3	ET1-7020	15	------	D	3	45	Gas test not reliable. Do not perform.
6J5	6.3	HS5-3080	23	------	B	3	50	
6J6	6.3	ET5-2070	15	------	D	3	23	Triode No. 1.
6J6	6.3	ET6-1070	15	------	D	3	23	Triode No. 2.
6J7	6.3	HS0-3485	22	------	B	3	31	Cap connects to grid No. 1.
6J8	6.3	HS5-3486	18	------	B	3	25	Heptode sect. Cap connects to grid.
6J8	6.3	HS5-6483	30	------	B	3	13	Triode sect.
6K4*	6.3	DU2-1050	31	------	D	3	16	C basing.
6K5	6.3	HS0-3080	21	------	B	3	25	Cap connects to grid.
6K6	6.3	HS5-3480	34	------	B	3	40	
6K7	6.3	HS0-3485	19	------	B	3	36	Cap connects to grid.
6K8	6.3	HS5-3486	11	------	B	3	25	Hexode sect. Cap connects to grid.
6K8	6.3	HS5-6483	0	------	C	3	30	Triode sect.
6L4	6.3	GR2-3070	25	------	D	3	25	
6L5	6.3	HS5-3080	27	------	B	3	38	
6L6	6.3	HS5-3481	23	------	D	3	25	
6L7	6.3	HS0-3485	23	------	B	3	16	Cap grid. Cap connects to grid.
6L7	6.3	HS5-3481	27	------	B	3	16	Pin grid.
6M3	6.3	JS0-0030	0	70	A	(#)	40	Cap connects to plate. Short on 3.

#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.

6N3	6.3	EV0-9030	0	40	A	7	40	
6N4								
6N4	6.3	ET1-5020	18	------	D	3	30	
6N5	6.3	GR5-4030	0	100	A	3	------	Eye open.
6N5	6.3	GR5-4230	0	100	A	3	------	Eye closed.
6N6	6.3	HS5-3480	0	------	B	3	38	
6N7	6.3	HS5-6083	12	------	B	3	38	Triode No. 1.
6N7	6.3	HS4-3086	12	------	B	3	38	Triode No. 2.
6N8	6.3	EV2-6139	17	------	B	3	55	Pentode sect.
6N8	6.3	EV2-7139	0	0	A	2	40	Diode No. 1.
6N8	6.3	EV2-8139	0	0	A	2	40	Diode No. 2.
6P5	6.3	HS5-3080	29	------	B	3	36	
6P7	6.3	CT0-4586	28	------	B	3	28	Pentode sect. Cap connects to grid.
6P7	6.3	CT7-6084	28	------	B	3	13	Triode sect.
6Q4	6.3	EV1-9030	0	------	D	3	50	
6Q5	6.3	HS5-3080	(#)	90	A	4	40	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6Q6	6.3	HS0–4080	0	14	A	2	40	Diode No. 2.
6Q7	6.3	HS0–3081	17	———	B	3	20	Triode sect. Cap connects to grid.
6Q7	6.3	HS0–5083	0	14	A	2	40	Diode No. 1.
6Q7	6.3	HS0–4083	0	14	A	2	40	Diode No. 2.
6R3	6.3	EV0–0090	0	25	A	(#)	40	Cap connects to plate.
#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.								
6R4	6.3	EV1–8030	23	———	C	3	50	
6R7	6.3	HS0–3081	18	———	B	3	48	Triode sect. Cap connects to grid.
6R7	6.3	HS0–5083	0	14	A	2	40	Diode No. 1.
6R7	6.3	HS0–4083	0	14	A	2	40	Diode No. 2.
6R8	6.3	EV8–9072	18	———	B	3	48	Triode sect.
6R8	6.3	EV0–1078	0	68	A	2	40	Diode No. 1.
6R8	6.3	EV0–6078	0	68	A	2	40	Diode No. 2.
6R8	6.3	EV0–2039	0	68	A	2	40	Diode No. 3.
6S4	6.3	EV6–9020	17	———	C	3	52	
6S7	6.3	HS0–3485	27	———	B	3	44	Cap connects to grid.
6S8	6.3	HY0–6020	10	———	B	3	23	Triode sect. Cap connects to grid.
6S8	6.3	HY0–3050	0	14	A	2	40	Diode No. 1.
6S8	6.3	HY0–4020	0	14	A	2	40	Diode No. 2.
6S8	6.3	HY0–1020	0	14	A	2	40	Diode No. 3.
6SA7	6.3	HS8–3465	Short test only.					
6SA7	6.3	HS5–4068	0	———	C	3	50	
6SB7	6.3	HS8–3465	Short test only.					
6SB7	6.3	HS5–4068	10	———	D	3	40	
6SC7	6.3	HY4–5062	0	———	B	3	25	Triode No. 1.
6SC7	6.3	HY3–2065	0	———	B	3	25	Triode No. 2.
6SD7	6.3	HS4–8653	10	———	D	3	15	
6SF5	6.3	HY3–5021	12	———	B	3	25	
6SF7	6.3	HY2–6431	0	———	B	3	50	Pentode sect.
6SF7	6.3	HY0–5436	0	14	A	2	40	Diode sect.
6SG7	6.3	HS4–8651	0	———	C	3	42	
6SH7	6.3	HS4–8651	0	———	C	3	43	
6SJ7	6.3	HS4–8653	22	———	B	3	40	
6SK7	6.3	HS4–8653	22	———	B	3	48	
6SL7	6.3	HY4–5062	0	———	B	3	32	Triode No. 1.
6SL7	6.3	HY1–2035	0	———	B	3	32	Triode No. 2.
6SN7	6.3	HY4–5062	23	———	B	3	50	Triode No. 1.
6SN7	6.3	HY1–2035	23	———	B	3	50	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
	#Should strike between settings 64 and 54 of the BIAS dial.							
6Q6----------	6.3	HS0–3080	17	------	B	3	25	Triode sect. Cap connects to grid.
6Q6----------	6.3	HS0–5080	0	14	A	2	40	Diode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6SQ7	6.3	HY2-6031	11	———	B	3	19	Triode sect.
6SQ7	6.3	HY0-5036	0	14	A	2	20	Diode No. 1.
6SQ7	6.3	HY0-4036	0	14	A	2	20	Diode No. 2.
6SR7	6.3	HY2-6031	18	———	B	3	48	Triode sect.
6SR7	6.3	HY0-5036	0	14	A	2	20	Diode No. 1.
6SR7	6.3	HY0-4036	0	14	A	2	20	Diode No. 2.
6SS7	6.3	HS4-8653	19	———	B	3	46	
6ST7	6.3	HY2-6031	15	———	B	3	48	Triode sect.
6ST7	6.3	HY0-5036	0	0	A	2	30	Diode No. 1.
6ST7	6.3	HY0-4036	0	0	A	2	30	Diode No. 2.
6SU7	6.3	HY4-5062	5	———	B	3	30	Triode No. 1.
6SU7	6.3	HY1-2035	5	———	B	3	30	Triode No. 2.
6SV7	6.3	HY2-6430	12	———	B	3	53	Pentode sect.
6SV7	6.3	HY2-5430	0	62	A	2	40	Diode sect.
6SZ7	6.3	HY2-6031	10	———	B	3	30	Triode sect.
6SZ7	6.3	HY0-5031	0	0	A	2	30	Diode No. 1.
6SZ7	6.3	HY0-4031	0	0	A	2	30	Diode No. 2.
6T4	6.3	ET2-1050	37	———	D	3	25	
6T5	6.3	GR5-4030	0	100	A	3	———	Eye open.
6T5	6.3	GR5-4230	0	100	A	3	———	Eye closed.
6T7	6.3	HS0-3080	17	———	B	3	25	Triode sect. Cap connects to grid.
6T7	6.3	HS0-5080	0	14	A	2	40	Diode No. 1.
6T7	6.3	HS0-4080	0	14	A	2	40	Diode No. 2.
6T8	6.3	EV8-9076	11	———	B	3	30	Triode sect.
6T8	6.3	EV0-6071	0	70	A	2	40	Diode No. 1.
6T8	6.3	EV0-2036	0	70	A	2	40	Diode No. 2.
6T8	6.3	EV0-1078	0	70	A	2	40	Diode No. 3.
6U3	6.3	EV0-9030	0	63	A	7	40	
6U4	6.3	HY0-5030	0	61	A	7	40	
6U5	6.3	GR5-4030	0	100	A	3	———	Eye open.
6U5	6.3	GR5-4230	0	100	A	3	———	Eye closed.
6U6	6.3	HS5-3480	30	———	D	3	32	
6U7	6.3	HS0-3485	21	———	B	3	40	Cap connects to grid No. 1.
6U8	6.3	EV2-6370	15	———	B	3	57	Pentode sect.
6U8	6.3	EV9-1080	16	———	C	3	57	Triode sect.
6V3	6.3	EV0-0020	0	65	A	(#)	40	Cap connects to plate.

#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.

6V4	6.3	EV0-7031	0	23	A	7	40	Plate No. 1.
6V4	6.3	EV0-1037	0	23	A	7	40	Plate No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6V5	6.3	HY5-3400	31	____	C	3	52	
6V6	6.3	HS5-3481	21	____	C	3	46	
6V7	6.3	HS0-3080	39	____	B	3	24	Triode sect. Cap connects to grid.
6V7	6.3	HS0-5080	0	14	A	2	40	Diode No. 1.
6V7	6.3	HS0-4080	0	14	A	2	40	Diode No. 2.
6V8	6.3	EV6-1038	11	____	B	3	30	Triode sect.
6V8	6.3	EV0-9032	0	0	A	2	30	Diode No. 1.
6V8	6.3	EV0-7086	0	72	A	2	40	Diode No. 2.
6V8	6.3	EV0-2038	0	72	A	2	40	Diode No. 3.
6W4	6.3	HY0-5030	0	63	A	7	40	
6W5	6.3	HS0-5080	0	40	A	7	40	Plate No. 1.
6W5	6.3	HS0-3080	0	40	A	7	40	Plate No. 2.
6W6	6.3	HS5-3480	56	____	C	3	38	
6W7	6.3	HS0-3485	22	____	B	3	31	Cap connects to grid No. 1.
6X4	6.3	ET0-6070	0	80	A	7	40	Plate No. 1.
6X4	6.3	ET0-1070	0	80	A	7	40	Plate No. 2.
6X5	6.3	HS0-5081	0	40	A	7	40	Plate No. 1
6X5	6.3	HS0-3081	0	40	A	7	40	Plate No. 2.
6X6	6.3	HS5-4086	100	100	A	4	____	Eyes open.
6X6	6.3	HS5-4386	100	100	A	4	____	Eyes closed.
6X8	6.3	EV7-9861	9	____	D	3	23	Pentode sect.
6X8	6.3	EV2-3861	15	____	D	3	23	Triode sect.
6Y5	6.3	GR0-5040	0	63	A	7	40	Plate No. 1.
6Y5	6.3	GR0-3040	0	63	A	7	40	Plate No. 2.
6Y6	6.3	HS5-3480	33	____	D	3	30	
6Y7	6.3	HS5-6083	15	____	B	3	25	Triode No. 1.
6Y7	6.3	HS4-3086	15	____	B	3	25	Triode No. 2.
6Z4	6.3	FR0-3040	0	46	A	7	40	Plate No. 1.
6Z4	6.3	FR0-2040	0	46	A	7	40	Plate No. 2.
6Z5	12.6	GS0-5040	0	38	A	7	40	Plate No. 1. Short on 8.
6Z5	12.6	GS0-3040	0	38	A	7	40	Plate No. 2. Short on 8.
6Z7	6.3	HS5-6080	0	____	B	3	30	Triode No. 1.
6Z7	6.3	HS4-3080	0	____	B	3	30	Triode No. 2.
6ZY5	6.3	HS0-5080	0	30	A	7	40	Plate No. 1.
6ZY5	6.3	HS0-3080	0	30	A	7	40	Plate No. 2.
7A4	6.3	JR6-2070	23	____	B	3	50	
7A5	7.3	JR6-2370	25	____	D	3	30	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
7A6	6.3	JR0-6075	0	60	A	2	40	Diode No. 1.
7A6	6.3	JR0-3025	0	60	A	2	40	Diode No. 2.
7A7	6.3	JR6-2374	27	.....	B	3	44	
7A8	6.3	JR6-2574		Short test only.				
7A8	6.3	JR4-5376	40	.....	B	3	31	
7AB7	6.3	HS5-3140	10	.....	B	3	46	
7AD7	6.3	JR6-2374	0	.....	D	3	81	
7AF7	6.3	JR5-6070	21	.....	C	3	33	Triode No. 1.
7AF7	6.3	JR4-3020	21	.....	C	3	33	Triode No. 2.
7AG7	6.3	JR6-2374	0	.....	C	3	38	
7AH7	6.3	JR6-2374	0	.....	C	3	42	
7AJ7	6.3	JR6-2374	0	.....	D	3	11	
7AK7	6.3	JR6-2374	0	.....	C	3	50	
7AU7	6.3	EV7-6080	24	.....	B	3	56	Triode No. 1.
7AU7	6.3	EV2-1030	24	.....	B	3	56	Triode No. 2.
7B4	6.3	JR6-2070	12	.....	B	3	25	
7B5	6.3	JR6-2370	34	.....	B	3	40	
7B6	6.3	JR3-2070	0	.....	B	3	28	Triode sect.
7B6	6.3	JR0-6072	0	14	A	2	40	Diode No. 1.
7B6	6.3	JR0-5072	0	14	A	2	40	Diode No. 2.
7B7	6.3	JR6-2374	27	.....	B	3	43	
TB8	6.3	JR6-2574		Short test only.				
TB8	6.3	JR4-5376	44	.....	B	3	29	
7C4	6.3	JR0-4070	0	52	A	2	40	Diode.
7C5	6.3	JR6-2370	30	.....	C	3	38	
7C6	6.3	JR3-2070	10	.....	B	3	15	Triode sect.
7C6	6.3	JR0-6072	0	0	A	2	30	Diode No. 1.
7C6	6.3	JR0-5072	0	0	A	2	30	Diode No. 2.
7C7	6.3	JR6-2374	22	.....	B	3	33	
7E5	6.3	JS1-3040	15	.....	C	3	38	
7E6	6.3	JR3-2070	12	.....	B	3	55	Triode sect.
7E6	6.3	JR0-6072	0	14	A	2	40	Diode No. 1.
7E6	6.3	JR0-5072	0	14	A	2	40	Diode No. 2.
7E7	6.3	JR6-2570	22	.....	B	3	33	Pentode sect.
7E7	6.3	JR0-4072	0	0	A	2	30	Diode No. 1.
7E7	6.3	JR0-3072	0	0	A	2	30	Diode No. 2.
7EY6	7.5	HS5-3480	31	.....	C	3	55	
7F7	6.3	JR5-6073	0	.....	B	3	33	Triode No. 1.
7F7	6.3	JR4-3026	0	.....	B	3	33	Triode No. 2.
7F8	6.3	HS8-6050	10	.....	D	3	25	Triode No. 1.
7F8	6.3	HS1-3040	10	.....	D	3	25	Triode No. 2.
7G7	6.3	JR6-2374	18	.....	B	3	50	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
7G8	6.3	JR5-7362	10		B	3	53	Tetrode No. 1.
7G8	6.3	JR4-2367	10		B	3	53	Tetrode No. 2.
7H7	6.3	JR6-2374	10		D	3	19	
7J7	6.3	JR6-2574	18		B	3	20	Heptode sect.
7J7	6.3	JR4-3576	18		B	3	25	Triode sect.
7K7	6.3	JR4-3020	0		B	3	25	Triode sect.
7K7	6.3	JR0-5070	0	20	A	2	40	Diode No. 1.
7K7	6.3	JR0-6070	0	20	A	2	40	Diode No. 2.
7L7	6.3	JR6-2374	12		B	3	50	
7N7	6.3	JR5-6073	23		B	3	50	Triode No. 1.
7N7	6.3	JR4-3026	23		B	3	50	Triode No. 2.
7Q7	6.3	JR6-2375	Short test only.					
7Q7	6.3	JR4-3076	20		C	3	57	
7R7	6.3	JR6-2570	10		C	3	38	Pentode sect.
7R7	6.3	JR0-4072	0	0	A	2	30	Diode No. 1.
7R7	6.3	JR0-3072	0	0	A	2	30	Diode No. 2.
7S7	6.3	JR6-2574	18		B	3	38	Heptode sect.
7S7	6.3	JR4-3576	0		B	3	38	Triode sect.
7T7	6.3	JR6-2374	9		C	3	38	
7V7	6.3	JR6-2374	6		C	3	50	
7W7	6.3	JR6-2375	10		D	3	18	
7X6	6.3	JR0-6075	0	57	A	7	40	Plate No. 1.
7X6	6.3	JR0-3025	0	57	A	7	40	Plate No. 2.
7X7	6.3	JR3-2040	0		B	3	23	Triode sect.
7X7	6.3	JR0-5040	0	67	A	2	40	Diode No. 1.
7X7	6.3	JR0-6070	0	67	A	2	40	Diode No. 2.
7Y4	6.3	JR0-6070	0	42	A	7	40	Plate No. 1.
7Y4	6.3	JR0-3070	0	42	A	7	40	Plate No. 2.
7Z4	6.3	JR0-6070	0	12	A	7	40	Plate No. 1.
7Z4	6.3	JR0-3070	0	12	A	7	40	Plate No. 2.
8AU8	7.5	EV7-9860	10		D	3	30	Pentode sect.
8AU8	7.5	EV2-3010	9		D	3	25	Triode sect.
8AW8A	7.5	EV7-9860	14		D	3	38	Pentode sect.
8AW8A	7.5	EV2-3010	9		D	3	20	Triode sect.
8BA8A	7.5	EV7-9860	11		D	3	30	Pentode sect.
8BA8A	7.5	EV2-3010	29		C	3	34	Triode sect.
8BH8	7.5	EV7-9860	8		D	3	30	Pentode sect.
8BH8	7.5	EV2-3010	29		C	3	42	Triode sect.
8BN8	7.5	EV8-7090	15		D	3	13	Triode sect.
8BN8	7.5	EV0-6030	0	70	A	2	40	Diode No. 1.
8BN8	7.5	EV0-1020	0	70	A	2	40	Diode No. 2.
8BQ5	7.5	EV2-7930	30		C	3	50	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
8CG7	7.5	EV7-6089	23	------	B	3	50	Triode No. 1.
8SG7	7.5	EV2-1039	23	------	B	3	50	Triode No. 2.
8CM7	7.5	EV7-6030	25	------	B	3	50	Triode No. 1.
8CM7	7.5	EV8-1090	22	------	D	3	22	Triode No. 2.
8CN7	7.5	EV7-8060	11	------	B	3	30	Triode sect.
8CN7	7.5	EV0-2030	0	70	A	2	40	Diode No. 1.
8CN7	7.5	EV0-1030	0	70	A	2	40	Diode No. 2.
8CS7	7.5	EV7-6080	17	------	C	3	28	Triode No. 1.
8CS7	7.5	EV3-1090	28	------	D	3	23	Triode No. 2.
8CX8	7.5	EV7-9860	11	------	D	3	31	Pentode sect.
8CX8	7.5	EV2-3010	26	------	C	3	25	Triode sect.
8CY7	7.5	EV7-6080	25	------	B	3	12	Triode No. 1.
8CY7	7.5	EV2-1090	65	------	C	3	50	Triode No. 2.
8EB8	7.5	EV7-9860	0	------	D	3	46	Pentode sect.
8EB8	7.5	EV2-3010	19	------	B	3	38	Triode sect.
8EM5	7.5	EV3-9170	23	------	D	3	25	
8ET7	7.5	EV7-9860	10	------	D	3	38	Pentode sect.
8ET7	7.5	EV0-3010	0	0	A	2	20	Diode No. 1.
8ET7	7.5	EV0-2010	0	0	A	2	20	Diode No. 2.
8FQ7	7.5	EV7-6080	23	------	B	3	50	Triode No. 1.
8FQ7	7.5	EV2-1030	23	------	B	3	50	Triode No. 2.
8GN8	7.5	EV7-9860	10	------	D	3	42	Pentode sect.
8GN8	7.5	EV2-3010	20	------	B	3	29	Triode sect.
8SN7	7.5	HY4-5060	23	------	B	3	50	Triode No. 1.
8SN7	7.5	HY1-2030	23	------	B	3	50	Triode No. 2.
9AU7	10.0	EV7-6080	24	------	B	3	56	Triode No. 1.
9AU7	10.0	EV2-1030	24	------	B	3	56	Triode No. 2.
9BR7	10.0	EV2-1030	17	------	C	3	38	Triode sect.
9BR7	10.0	EV0-7080	0	53	A	2	36	Diode No. 1.
9BR7	10.0	EV0-6080	0	53	A	2	36	Diode No. 2.
9CL8	10.0	EV9-6780	8	------	D	3	20	Tetrode sect.
9CL8	10.0	EV1-2030	12	------	D	3	35	Triode sect.
9DZ8	10.0	EV3-6720	24	------	D	3	30	Pentode sect.
9DZ8	10.0	EV1-9080	26	------	B	3	15	Triode sect.
9U8	10.0	EV2-6370	15	------	B	3	57	Pentode sect.
9U8	10.0	EV9-1080	16	------	C	3	57	Triode sect.
9X8	10.0	EV7-9861	9	------	D	3	23	Pentode sect.
9X8	10.0	EV2-3861	15	------	D	3	23	Triode sect.
10	7.5	ER3-2000	39	------	B	3	32	
10BQ5	10.0	EV2-7930	30	------	C	3	50	Short on 1-2-3-5.
10C8	10.0	EV8-6790	8	------	D	3	32	Pentode sect.
10C8	10.0	EV2-1030	13	------	D	3	22	Triode sect.
10DA7	10.0	EV7-6080	23	------	C	3	32	Triode No. 1.
10DA7	10.0	EV3-1090	55	------	D	3	25	Triode No. 2.
10DE7	10.0	EV7-6080	31	------	B	3	51	Triode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
10DE7	10.0	EV2-1090	54	------	D	3	33	Triode No. 2.
10DR7	10.0	EV7-6080	22	------	B	3	20	Triode No. 1.
10DR7	10.0	EV2-1090	54	------	D	3	31	Triode No. 2.
10EG7	10.0	HY4-5060	32	------	B	3	50	Triode No. 1.
10EG7	10.0	HY1-2030	56	------	D	3	38	Triode No. 2.
10EM7	10.0	HY4-5060	20	------	B	3	25	Triode No. 1.
10EM7	10.0	HY1-2030	60	------	D	3	35	Triode No. 2.
10HF8	10.0	EV7-9860	10	------	D	3	35	Pentode sect.
10HF8	10.0	EV2-3010	30	------	B	3	25	Triode sect.
10Y	7.5	ER3-2000	12	------	B	3	38	
11C5	10.0	ET2-7610	32	------	D	3	23	
11CY7	10.0	EV7-6080	25	------	B	3	12	Triode No. 1.
11CY7	10.0	EV2-1090	65	------	C	3	50	Triode No. 2.
12A	5.0	ER3-2000	44	------	B	3	42	
12A4	12.6	EV2-9010	25	------	D	3	39	
12A5	12.6	HR4-2350	51	------	B	3	45	
12A6	12.6	HS5-3481	12	------	C	3	38	
12A7	12.6	HR0-2365	48	------	B	3	24	Pentode sect. Cap connects to grid.
12A7	12.6	HR0-5042	0	50	A	7	40	Rectifier sect.
12A8	12.6	HS5-4683	41	------	B	3	29	Cap connects to grid No. 4.
12AB5	12.6	EV3-9170	21	------	C	3	46	
12AC5	12.6	ET2-6571	35	------	A	2	16	Make no gas test.
12AD6	12.6	ET7-6521	30	0	A	2	28	Make no gas test.
12AD7	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
12AD7	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
12AE6	12.6	ET0-7021	0	0	A	2	12	Triode sect. Make no gas test.
12AE6	12.6	ET0-6020	0	0	A	2	40	Diode No. 1.
12AE6	12.6	ET0-5020	0	0	A	2	40	Diode No. 2.
12AE7	12.6	EV0-6087	0	45	A	2	40	Make no gas test.
12AE7	12.6	EV0-1032	0	58	A	2	40	Make no gas test.
12AF3	12.6	EV0-0020	0	32	A	(#)	60	Cap connects to plate.
	#Hold down pushbutton 8-METER REV. and press pushbutton RECT.							
12AF6	12.6	ET1-5672	27	------	B	(#)	29	
	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.							
12AG6	12.6	ET7-6521	30	0	A	2	44	Make no gas test.
12AH7	12.6	HY5-6043	20	------	B	3	50	Triode No. 1.
12AH7	12.6	HY1-3026	20	------	B	3	50	Triode No. 2.
12AJ6	12.6	ET0-7021	0	0	A	2	8	Triode sect. Make no gas test.
12AJ6	12.6	ET0-6020	0	0	A	2	40	Diode No. 1.
12AJ6	12.6	ET0-5020	0	0	A	2	40	Diode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12AJ7	12.6	EV2-6137	27	------	B	3	31	Heptode sect.
12AJ7	12.6	EV9-8036	26	------	B	3	50	Triode sect.
12AL5	12.6	ET0-7010	0	70	A	2	40	Diode No. 1.
12AL5	12.6	ET0-2050	0	70	A	2	40	Diode No. 2.
12AL8	12.6	EV0-3672	0	55	A	2	50	Tetrode sect. Make no gas test.
12AL8	12.6	EV0-1098	0	0	A	2	10	Triode sect. Make no gas test.
12AQ5	12.6	ET1-5620	21	------	C	3	46	
12AS5	12.6	ET2-7610	25	------	D	3	28	
12AT6	12.6	ET1-7020	18	------	B	3	30	Triode sect.
12AT6	12.6	ET1-6020	0	0	A	2	40	Diode No. 1.
12AT6	12.6	ET1-5020	0	0	A	2	40	Diode No. 2.
12AT7	12.6	EV7-6080	10	------	C	3	50	Triode No. 1.
12AT7	12.6	EV2-1030	10	------	C	3	50	Triode No. 2.
12AU6	12.6	ET1-5672	16	------	B	3	58	
12AU7	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
12AU7	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
12AU8	12.6	EV7-9860	10	------	D	3	30	Pentode sect.
12AU8	12.6	EV2-3010	9	------	D	3	25	Triode sect.
12AV5	12.6	HS1-5830	50	------	C	3	49	
12AV6	12.6	ET1-7025	12	------	B	3	32	Triode sect.
12AV6	12.6	ET1-6025	0	0	A	2	40	Diode No. 1.
12AV6	12.6	ET1-5026	0	0	A	2	40	Diode No. 2.
12AV7	12.6	EV7-6080	18	------	D	3	21	Triode No. 1.
12AV7	12.6	EV2-1030	18	------	D	3	21	Triode No. 2.
12AW6	12.6	ET1-5627	10	------	D	3	20	
12AX4	12.6	HY0-5030	0	54	A	7	40	
12AX7	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
12AX7	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
12AY7	12.6	EV7-6080	15	------	B	3	32	Triode No. 1.
12AY7	12.6	EV2-1030	15	------	B	3	32	Triode No. 2.
12AZ7	12.6	EV7-6080	10	------	C	3	50	Triode No. 1.
12AZ7	12.6	EV2-1030	10	------	C	3	50	Triode No. 2.
12B4	12.6	EV2-9010	50	------	D	3	32	
12B7	12.6	JR6-2374	22	------	B	3	48	
12B8	12.6	HS0-3410	22	------	B	3	46	Pentode sect. Cap connects to grid.
12B8	12.6	HS8-5060	0	------	B	3	50	Triode sect.
12BA6	12.6	ET1-5672	9	------	C	3	41	
12BA7	12.6	EV7-9136				Short test only.		
12BA7	12.6	EV2-1037	10	------	D	3	40	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12BD6	12.6	ET1-5672	19	———	B	3	50	
13BE6	12.6	ET7-5621	Short test only.					
12BE6	12.6	ET1-6027	17	———	D	3	36	
12BF6	12.6	ET1-7020	14	———	B	3	48	Triode sect.
12BF6	12.6	ET1-6020	0	0	A	2	40	Diode No. 1.
12BF6	12.6	ET1-5020	0	0	A	2	40	Diode No. 2.
12BH7	12.6	EV7-6082	29	———	C	3	30	Triode No. 1.
12BH7	12.6	EV2-1037	29	———	C	3	30	Triode No. 2.
12BK5	12.6	EV3-1860	0	———	D	3	28	
12BK6	12.6	ET1-7025	6	———	B	3	32	Triode sect.
12BK6	12.6	ET0-6025	0	40	A	2	40	Diode No. 1.
12BK6	12.6	ET0-5027	0	40	A	2	40	Diode No. 2.
12BL6	12.6	ET2-6571	30	0	A	2	40	Make no gas test.
12BN6	12.6	ET2-7516	0	———	B	3	18	Limiter grid.
12BN6	12.6	ET6-7512	0	———	B	3	23	Quadrature grid.
12BQ6	12.6	HS5-0480	50	———	C	3	56	Cap connects to plate.
12BR7	12.6	EV2-1030	14	———	D	3	20	Triode sect.
12BR7	12.6	EV0-7080	0	70	A	2	40	Diode No. 1.
12BR7	12.6	EV0-6080	0	70	A	2	40	Diode No. 2.
12BT6	12.6	ET1-7020	13	———	B	3	33	Triode sect.
12BT6	12.6	ET1-6020	0	40	A	2	40	Diode No. 1.
12BT6	12.6	ET1-5020	0	40	A	2	40	Diode No. 2.
12BU6	12.6	ET1-7020	34	———	B	3	38	Triode sect.
12BU6	12.6	ET1-6020	0	40	A	2	40	Diode No. 1.
12BU6	12.6	ET1-5020	0	40	A	2	40	Diode No. 2.
12BV7	12.6	EV2-7813	9	———	D	3	46	
12BW4	12.6	EV0-7091	0	15	A	7	40	Plate No. 1.
12BW4	12.6	EV0-1097	0	15	A	7	40	Plate No. 2.
12BY7	12.6	EV2-7813	9	———	D	3	46	
12BZ6	12.6	ET1-5627	20	———	C	3	31	
12BZ7	12.6	EV7-6080	8	———	D	3	18	Triode No. 1.
12BZ7	12.6	EV2-1030	8	———	D	3	18	Triode No. 2.
12C5	12.6	ET2-7610	10	———	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12C8	12.6	HS0-3681	24	———	B	3	29	Pentode sect. Cap connects to grid No. 1.
12C8	12.6	HS0-5083	0	0	A	2	40	Diode No. 1.
12C8	12.6	HS0-4083	0	0	A	2	40	Diode No. 2.
12CA5	12.6	ET2-7610	25	———	D	3	30	
12CM6	12.6	EV3-9170	21	———	C	3	46	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12CN5	12.6	ET0-6712	0	0	A	2	50	Make no gas test.
12CR6	12.6	ET7-5612	18	------	B	3	56	Pentode sect.
12CR6	12.6	ET0-2010	0	14	A	2	40	Diode sect.
12CS6	12.6	ET1-5627	20	------	B	(#)	8	Grid No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
16CS6	12.6	ET7-5621	0	------	B	(#)	12	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12CT8	12.6	EV8-6790	10	------	D	3	30	Pentode sect.
12CT8	12.6	EV2-1030	9	------	D	3	25	Triode sect.
12CU5	12.6	ET2-7610	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12CU6	12.6	HS5-0480	50	------	C	3	56	Cap connects to plate.
12CX6	12.6	ET2-6571	0	0	A	2	50	Make no gas test.
12D4	12.6	HY0-5030	0	60	A	7	40	
12DB5	12.6	EV3-9120	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12DE8	12.6	EV7-8691	0	0	A	2	32	Pentode sect. Make no gas test.
12DE8	12.6	EV0-3020	0	58	A	2	40	Diode sect.
12DF5	12.6	EV0-6080	0	15	A	7	40	Plate No. 1.
12DF5	12.6	EV0-1030	0	15	A	7	40	Plate No. 2.
12DF7	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
12DF7	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
12DK7	12.6	EV0-3721	0	25	A	2	50	Tetrode sect. Make no gas test.
12DK7	12.6	EV0-6020	0	0	A	2	25	Diode No. 1.
12DK7	12.6	EV0-9020	0	0	A	2	25	Diode No. 2.
12DL8	12.6	EV0-3627	0	48	A	2	60	Tetrode sect. Make no gas test.
12DL8	12.6	EV0-9080	0	0	A	2	40	Diode No. 1.
12DL8	12.6	EV0-1080	0	0	A	2	40	Diode No. 2.
12DM4	12.6	HY0-5030	0	38	A	7	50	
12DM5	12.6	ET2-7610	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12DQ6	12.6	HS5-0480	36	------	D	3	30	Cap connects to plate.
12DQ7	12.6	EV2-7819	0	------	D	3	40	
12DS7	12.6	EV7-3680	0	53	A	2	50	Tetrode sect. Make no gas test.
12DS7	12.6	EV0-9080	0	0	A	2	32	Diode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12DS7	12.6	EV0-1080	0	0	A	2	32	Diode No. 2.
12DT5	12.6	EV3-9170	31	———	C	3	60	
12DT7	12.6	EV7-6080	12	———	B	3	32	Triode No. 1.
12DT7	12.6	EV2-1030	12	———	B	3	32	Triode No. 2.
12DT8	12.6	EV7-6089	10	———	C	3	50	Triode No. 1.
12CT8	12.6	EV2-1039	10	———	C	3	50	Triode No. 2.
12DU7	12.6	EV0-3621	0	40	A	2	50	Tetrode sect. Make no gas test.
12DU7	12.6	EV0-9020	0	0	A	2	16	Diode No. 1.
12DU7	12.6	EV0-7020	0	0	A	2	16	Diode No. 2.
12DV7	12.6	EV0-6087	0	0	A	2	14	Triode sect. Make no gas test.
12DV7	12.6	EV0-3010	0	0	A	2	16	Diode No. 1.
12DV7	12.6	EV0-2010	0	0	A	2	16	Diode No. 2.
12DV8	12.6	EV0-3627	0	56	A	2	32	Tetrode sect. Make no gas test.
12DV8	12.6	EV0-9080	0	0	A	2	32	Diode No. 1.
12DV8	12.6	EV0-1080	0	0	A	2	32	Diode No. 2.
12DW5	12.6	EV3-9170	50	———	C	3	56	
12DW7	12.6	EV7-6080	12	———	B	3	32	Triode No. 1.
12DW7	12.6	EV2-1030	24	———	B	3	55	Triode No. 2.
12DW8	12.6	EV7-6080	29	0	A	2	56	Triode No. 1. Make no gas test.
12DW8	12.6	EV2-1030	0	62	A	2	50	Triode No. 2. Make no gas test.
12DW8	12.6	EV0-9080	0	48	A	2	32	Diode sect.
12DY8	12.6	EV0-3621	0	42	A	2	50	Tetrode sect. Make no gas test.
12DY8	12.6	EV0-8079	0	0	A	2	22	Triode sect.
12DZ6	12.6	ET2-6571	0	23	A	2	50	Make no gas test.
12DZ8	12.6	EV3-6720	24	———	D	3	30	Pentode sect.
12DZ8	12.6	EV1-9080	26	———	B	3	15	Triode sect.
12EA6	12.6	ET2-6571	0	18	A	2	50	Make no gas test.
12EC8	12.6	EV0-7689	0	0	A	2	28	Pentode sect. Make no gas test.
12EC8	12.6	EV0-2031	0	13	A	2	38	Triode sect.
12ED5	12.6	ET2-7610	25	———	D	3	30	
12EG6	12.6	ET7-6521	0	0	A	2	50	Make no gas test.
12EH5	12.6	ET2-7610	31	———	C	3	50	
12EK6	12.6	ET2-6571	0	24	A	2	50	Make no gas test.
12EL6	12.6	ET0-2071	0	0	A	2	6	Triode sect. Make no gas test.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12EL6	12.6	ET0-6070	0	0	A	2	20	Diode No. 1.
12EL6	12.6	ET0-5070	0	0	A	2	20	Diode No. 2.
12EM6	12.6	EV0-3621	0	25	A	2	50	Tetrode sect. Make no gas test.
12EM6	12.6	EV0-9020	0	0	A	2	25	Diode sect.
12EN6	12.6	HS5-3480	40	.....	D	3	30	
12EQ7	12.6	EV2-7631	29	.....	D	3	27	Pentode sect.
12EQ7	12.6	EV0-8030	0	0	A	2	34	Diode sect.
12EZ6	12.6	ET2-6571	0	0	A	2	37	Make no gas test.
12F5	12.6	HS0-4080	12	.....	B	3	25	Cap connects to grid.
12F8	12.6	EV9-2378	30	0	A	2	16	Pentode sect. Make no gas test.
12F8	12.6	EV0-6070	0	0	A	2	20	Diode No. 1.
12F8	12.6	EV0-1070	0	0	A	2	20	Diode No. 2.
12FK6	12.6	ET1-7020	23	0	A	2	32	Triode sect. Make no gas test.
12FK6	12.6	ET0-6025	0	0	A	2	23	Diode No. 1.
12FK6	12.6	ET0-5026	0	0	A	2	23	Diode No. 2.
12FM6	12.6	ET0-7021	0	0	A	2	31	Triode sect. Make no gas test.
12FM6	12.6	ET0-6020	0	0	A	2	25	Diode No. 1.
12FM6	12.6	ET0-5020	0	0	A	2	25	Diode No. 2.
12FQ8	12.6	EV7-8090	11	.....	B	3	22	Triode No. 1.—Plate No. 1.
12FQ8	12.6	EV7-6030	11	.....	B	3	22	Triode No. 1—Plate No. 2.
12FQ8	12.6	EV2-3090	11	.....	B	3	22	Triode No. 2—Plate No. 1.
12FQ8	12.6	EV2-1090	11	.....	B	3	22	Triode No. 2—Plate No. 2.
12FR8	12.6	EV3-6700	40	43	A	2	44	Pentode sect. Make no gas test.
12FR8	12.6	EV1-9020	25	10	A	2	40	Triode sect. Make no gas test.
12FR8	12.6	EV0-8020	0	0	A	2	26	Diode sect.
12FT6	12.6	ET1-7020	0	34	A	2	50	Triode sect. Make no gas test.
12FT6	12.6	ET0-6020	0	0	A	2	32	Diode No. 1.
12FT6	12.6	ET0-5020	0	0	A	2	32	Diode No. 2.
12FX8	12.6	EV9-1372	30	0	A	2	42	Heptode sect. Make no gas test.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
12FX8	12.6	EV0-8006	0	42	A	2	65	Triode sect. Make no gas test.
12G4	12.6	ET6-1070	23	------	B	3	50	
12G8	12.6	EV0-6078	0	30	A	2	50	Triode No. 1. Make no gas test.
12G8	12.6	EV0-1023	0	0	A	2	32	Triode No. 2. Make no gas test.
12GA6	12.6	ET7-6521	30	0	A	2	33	Make no gas test.
12GC6	12.6	HS5-0830	47	------	D	3	32	Cap connects to plate.
12GW6	12.6	HS5-0480	34	------	D	(1)	38	Cap connects to plate.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12H6	12.6	HS0-5081	0	63	A	2	40	Diode No. 1.
12H6	12.6	HS0-3041	0	63	A	2	40	Diode No. 2.
12J5	12.6	HS5-3081	23	------	B	3	50	
12J7	12.6	HS0-3485	22	------	B	3	31	Cap connects to grid.
12J8	12.6	EV0-3621	0	30	A	2	50	Tetrode sect. Make no gas test.
12J8	12.6	EV0-9070	0	56	A	2	40	Diode No. 1.
12J8	12.6	EV0-8070	0	56	A	2	40	Diode No. 2.
12K5	12.6	ET2-7510	10	------	C	(#)	38	Make no gas test.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND. Release pushbutton 3 before pushbutton 2.								
12K7	12.6	HS0-3485	19	------	B	3	36	Cap connects to grid.
12K8	12.6	HS5-3486	11	------	B	3	25	Heptode sect. Cap connects to grid No. 3 hexode.
12K8	12.6	HS5-6483	0	------	C	3	30	Triode sect.
12L6	12.6	HS5-3480	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12L8	12.6	HW1-8523	10	------	B	3	54	Pentode No. 1.
12L8	12.6	HW3-4521	10	------	B	3	54	Pentode No. 2.
12Q7	12.6	HS0-3080	17	------	B	3	20	Triode sect. Cap connects to grid.
12Q7	12.6	HS0-5083	0	14	A	2	40	Diode No. 1.
12Q7	12.6	HS0-4083	0	14	A	2	40	Diode No. 2.
12R5	12.6	ET2-7610	20	------	D	(#)	35	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12S8	12.6	HY0-6020	10	------	B	3	23	Triode sect. Cap connects to grid.
12S8	12.6	HY0-3050	0	14	A	2	40	Diode No. 1.
12S8	12.6	HY0-4020	0	14	A	2	40	Diode No. 2.
12S8	12.6	HY0-1020	0	14	A	2	40	Diode No. 3.

DATA TABLE—Continued

Tube type	*Fila-ment*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Mini-mum value*	*Notations*
12SA7	12.6	HS8-3465			Short test only.			
12SA7	12.6	HS5-4068	0	------	C	3	50	
12SC7	12.6	HY4-5062	0	------	B	3	25	Triode No. 1.
12SC7	12.6	HY3-2065	0	------	B	3	25	Triode No. 2.
12SF5	12.6	HY3-5020	12	------	B	3	25	
12SF7	12.6	HY2-6431	0	------	B	3	50	Pentode sect.
12SF7	12.6	HY0-5036	0	14	A	2	40	Diode sect.
12SG7	12.6	HS4-8651	0	------	C	3	42	
12SH7	12.6	HS4-8651	0	------	C	3	43	
12SJ7	12.6	HS4-8653	22	------	B	3	40	
12SK7	12.6	HS4-8653	22	------	B	3	48	
12SL7	12.6	HY4-5062	0	------	B	3	32	Triode No. 1.
12SL7	12.6	HY1-2035	0	------	B	3	32	Triode No. 2.
12SN7	12.6	HY4-5062	23	------	B	3	50	Triode No. 1.
12SN7	12.6	HY1-2035	23	------	B	3	50	Triode No. 2.
12SQ7	12.6	HY2-6031	11	------	B	3	19	Triode sect.
12SQ7	12.6	HY0-5036	0	14	A	2	20	Diode No. 1.
12SQ7	12.6	HY0-4036	0	14	A	2	20	Diode No. 2.
12SR7	12.6	HY2-6031	18	------	B	3	48	Triode sect.
12SR7	12.6	HY0-5036	0	14	A	2	20	Diode No. 1.
12SR7	12.6	HY0-4036	0	14	A	2	20	Diode No. 2.
12SW7	12.6	HY2-6031	14	------	B	3	48	Triode sect.
12SW7	12.6	HY0-5036	0	14	A	2	40	Diode No. 1.
12SW7	12.6	HY0-4036	0	14	A	2	40	Diode No. 2.
12SX7	12.6	HY4-5062	14	------	C	3	33	Triode No. 1.
12SX7	12.6	HY1-2035	14	------	C	3	33	Triode No. 2.
12SY7	12.6	HS8-3465			Short test only.			
12SY7	12.6	HS5-4068	15	------	D	3	23	
12U7	12.6	EV0-6087	0	0	A	2	12	Triode No. 1. Make no gas test.
12U7	12.6	EV0-1032	0	0	A	2	12	Triode No. 2. Make no gas test.
12V6	12.6	HS5-3480	21	------	C	3	46	
12W6	12.6	HS5-3480	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
12X4	12.6	ET0-6070	0	30	A	7	40	Plate No. 1.
12X4	12.6	ET0-1070	0	30	A	7	40	Plate No. 2.
12Z3	12.6	ER0-2030	0	52	A	7	40	
12Z5	12.6	GS0-5040	0	38	A	7	40	Plate No. 1.
12Z5	12.6	GS0-3040	0	38	A	7	40	Plate No. 2.
13DE7	12.6	EV7-6080	31	------	B	3	51	Triode No. 1.
13DE7	12.6	EV2-1090	54	------	D	3	33	Triode No. 2.
13DR7	12.6	EV7-6080	22	------	B	3	20	Triode No. 1.
13DR7	12.6	EV2-1090	54	------	D	3	31	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
13EM7	12.6	HY4-5060	20	------	B	3	25	Triode No. 1.
13EM7	12.6	HY1-2030	60	------	D	3	35	Triode No. 2.
13FR7	12.6	EV7-6080	20	------	B	3	25	Triode No. 1.
13FR7	12.6	EV3-1090	60	------	D	3	35	Triode No. 2.
14A4	12.6	JR6-2070	23	------	B	3	50	
14A5	12.6	JR6-2370	12	------	C	3	38	
14A7	12.6	JR6-2375	22	------	B	3	48	
14AF7	12.6	JR5-6070	21	------	C	3	33	Triode No. 1.
14AF7	12.6	JR4-3020	21	------	C	3	33	Triode No. 2.
14B6	12.6	JR3-2070	0	------	B	3	28	Triode sect.
14B6	12.6	JR0-6072	0	14	A	2	40	Diode No. 1.
14B6	12.6	JR0-5072	0	14	A	2	40	Diode No. 2.
14B8	12.6	JR6-2574				Short test only.		
14B8	12.6	JR4-5376	44	------	B	3	29	
14C5	12.6	JR6-2370	23	------	C	3	46	
14C7	12.6	JR6-2374	22	------	B	3	33	
14E6	12.6	JR3-2070	12	------	B	3	55	Triode sect.
14E6	12.6	JR0-6072	0	14	A	2	40	Diode No. 1.
14E6	12.6	JR0-5072	0	14	A	2	40	Diode No. 2.
14E7	12.6	JR6-2570	24	------	B	3	33	Pentode sect.
14E7	12.6	JR0-4072	0	0	A	2	30	Diode No. 1.
14E7	12.6	JR0-3072	0	0	A	2	30	Diode No. 2.
14F7	12.6	JR5-6073	0	------	B	3	40	Triode No. 1.
14F7	12.6	JR4-3026	0	------	B	3	40	Triode No. 2.
14F8	12.6	HS8-6050	10	------	D	3	25	Triode No. 1.
14F8	12.6	HS1-3040	10	------	D	3	25	Triode No. 2.
14GT8	12.6	EV8-9070	20	------	B	3	12	Triode sect.
14GT8	12.6	EV0-2030	0	0	A	2	32	Diode No. 1.
14GT8	12.6	EV0-6010	0	0	A	2	32	Diode No. 2.
14H7	12.6	JR6-2374	10	------	D	3	19	
14J7	12.6	JR6-2574	18	------	B	3	20	Heptode sect.
14J7	12.6	JR4-3576	18	------	B	3	25	Triode sect.
14JG8	12.6	EV8-9070	10	------	B	3	38	Triode sect.
14JG8	12.6	EV0-6010	0	70	A	2	40	Diode No. 1.
14JG8	12.6	EV0-2030	0	70	A	2	40	Diode No. 2.
14N7	12.6	JR5-6073	23	------	B	3	50	Triode No. 1.
14N7	12.6	JR4-3026	23	------	B	3	50	Triode No. 2.
14Q7	12.6	JR6-2375				Short test only.		
14Q7	12.6	JR4-3076	20	------	C	3	57	
14R7	12.6	JR6-2570	10	------	C	3	38	Pentode sect.
14R7	12.6	JR0-4072	0	0	A	2	30	Diode No. 1.
14R7	12.6	JR0-3072	0	0	A	2	30	Diode No. 2.
14S7	12.6	JR6-2574	18	------	B	3	38	Heptode sect.
14S7	12.6	JR4-3576	0	------	B	3	38	Triode sect.
14V7	12.6	JR6-2374	6	------	C	3	50	

DATA TABLE—Continued

Tube type	*Fila-ment*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Mini-mum value*	*Notations*
14W7	12.6	JR6-2375	10	------	D	3	18	
14X7	12.6	JR3-2040	0	------	B	3	23	Triode sect.
14X7	12.6	JR0-5040	0	67	A	2	40	Diode No. 1.
14X7	12.6	JR0-6070	0	67	A	2	40	Diode No. 2.
14Y4	12.6	JR0-6070	0	30	A	7	40	Plate No. 1.
14Y4	12.6	JR0-3070	0	30	A	7	40	Plate No. 2.
14Z3	12.6	ER0-2030	0	52	A	7	40	
15	2.0	FR0-2340	10	------	B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
15A6	12.6	EV2-7136	7	------	D	3	50	
15EA7	12.6	JX4-5060	10	------	B	3	39	Triode No. 1.
15EA7	12.6	JX1-2030	56	------	D	3	33	Triode No. 2.
15EW6	12.6	ET1-5627	24	------	C	3	41	Set LINE TEST at 68.
16A5	20.0	EV2-7930	27	------	C	3	56	Make LINE TEST at 50.
16A8	20.0	EV3-6720	26	------	C	3	58	Make LINE TEST at 50.
16A8	20.0	EV1-9080	21	------	B	3	23	Make LINE TEST at 50.
17AV5	20.0	HS1-5830	35	------	D	3	28	Make LINE TEST at 56.
17AX4	20.0	JX0-5030	0	54	A	7	40	Make LINE TEST at 56.
17BQ6	20.0	HS5-0480	55	------	C	3	50	Cap connects to plate. Make LINE TEST at 50.
17C5	20.0	ET2-7610	10	------	D	(#)	40	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
17CA5	20.0	ET2-7610	15	------	D	3	25	Make LINE TEST at 56.
17D4	20.0	HY0-5030	0	34	A	7	52	Make LINE TEST at 54.
17DE4	20.0	HY0-5030	0	38	A	7	50	Make LINE TEST at 58.
17DM4	20.0	HY0-5030	0	38	A	7	50	Make LINE TEST at 58.
17DQ6	20.0	HS5-0480	36	------	D	3	30	Cap connects to plate.
17EW8	20.0	EV7-6080	13	------	C	3	57	Triode No. 1.
17EW8	20.0	EV2-1030	13	------	C	3	57	Triode No. 2.
17GW6	See data following tube type 7895.							
17H3	20.0	EV0-3010	0	50	A	7	40	Make LINE TEST at 56.
17L6	20.0	HS5-3480	10	------	D	(#)	38	Make LINE TEST at 56.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
17R5	20.0	ET2-7610	20	------	D	(#)	25	Make LINE TEST at 56.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
18A5	20.0	HS1-5830	43	------	C	3	60	
18DZ8	20.0	EV3-6720	24	------	D	3	30	Pentode sect.
18DZ8	20.0	EV1-9080	26	------	B	3	15	Triode sect.
18FW6	20.0	ET1-5672	24	------	B	3	50	
18FX6	20.0	ET1-5627	20	------	B	3	28	Amplifier sect.
18FX6	20.0	ET1-6027	18	------	D	3	30	Oscillator sect.
18FY6	20.0	ET1-7020	30	0	A	3	28	Triode sect.
18FY6	20.0	ET0-6020	0	0	A	2	26	Diode No. 1.
18FY6	20.0	ET0-5020	0	0	A	2	26	Diode No. 2.
18HB8	20.0	EV9-7680	30	------	C	3	46	Pentode sect.
18HB8	20.0	EV1-3020	30	------	B	3	17	Triode sect.
19	2.0	GS4-5000	15	------	B	3	25	Triode No. 1.
19	2.0	GR3-2000	15	------	B	3	25	Triode No. 2.
19AU4	20.0	HY0-5030	0	66	A	7	40	
19AQ5	20.0	ET1-5620	21	------	C	3	46	
19BG6	20.0	HS5-0830	18	------	D	3	30	Cap connects plate.
19C8	20.0	EV8-9070	23	------	B	3	13	Triode sect.
19C8	20.0	EV8-6070	0	70	A	2	40	Diode No. 1.
19C8	20.0	EV8-2030	0	70	A	2	40	Diode No. 2.
19C8	20.0	EV8-1070	0	70	A	7	40	Cap connects to plate.
19CL8A	20.0	EV9-6780	12	------	D	3	20	Triode sect.
19CL8A	20.0	EV1-2030	12	------	D	3	35	Triode sect.
19EA8	20.0	EV2-6370	0	------	D	3	28	Pentode sect.
19EA8	20.0	EV9-1080	10	------	D	3	42	Triode sect.
19EZ8	20.0	EV9-8000	30	------	B	3	20	Triode No. 1.
19EZ8	20.0	EV7-6000	30	------	B	3	20	Triode No. 2.
19EZ8	20.0	EV2-3010	31	------	B	3	24	Triode No. 3.
19G3	4.3	HS0-0000	0	------	A	7	40	Cap connects to plate.
19HV8	20.0	EV9-6780	10	------	D	3	22	Pentode sect.
19HV8	20.0	EV1-2030	25	------	B	3	20	Triode sect.
19J6	20.0	ET5-2076	17	------	D	3	27	Triode No. 1.
19J6	20.0	ET6-1075	17	------	D	3	27	Triode No. 2.
19T8	20.0	EV8-9076	11	------	B	3	30	Triode sect.
19T8	20.0	EV0-6071	0	70	A	2	40	Diode No. 1.
19T8	20.0	EV0-2036	0	70	A	2	40	Diode No. 2.
19T8	20.0	EV0-1078	0	70	A	2	40	Diode No. 3.
19V8	20.0	EV6-1038	11	------	B	3	30	Triode sect.
19V8	20.0	EV0-9032	0	0	A	2	30	Diode No. 1.
19V8	20.0	EV0-7086	0	72	A	2	40	Diode No. 2.
19V8	20.0	EV0-2038	0	72	A	2	40	Diode No. 3.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
19X3	20.0	EV0-9030	0	63	A	7	40	
19X8	20.0	EV7-9861	9	------	D	3	23	Pentode sect.
19X8	20.0	EV2-3861	15	------	D	3	23	Triode sect.
19Y3	20.0	EV0-9030	0	63	A	7	40	
20	3.0	ER3-2000	77	------	B	3	13	
20EQ7	20.0	EV2-7631	29	------	B	3	27	Pentode sect.
20EQ7	20.0	EV0-8030	0	0	A	2	34	Triode sect.
20EZ7	20.0	CR8-7090	12	------	B	3	32	Triode No. 1.
20EZ7	20.0	CR5-6040	12	------	B	3	32	Triode No. 2.
RK20A	7.5	FR3-0240	0	------	C	3	32	Cap connects to plate.
VX21	1.1	CX0-4000	0	0	A	2	10	Pins: F−=2, F+=7, P=4.
21A6	20.0	EV2-0839	45	------	D	3	30	Cap connects to plate.
21EX6	20.0	HS5-0830	49	------	D	3	39	Cap connects to plate. Tubes showing shorts: retest using HS5-0310.
22	3.0	ER0-2300	20	------	B	(#)	13	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
22DE4	25.0	HY0-5030	0	38	A	7	50	Make LINE TEST at 58.
24	2.5	FR0-2340	12	------	B	3	25	Cap connects to grid.
24A	2.5	FR0-2340	12	------	B	3	25	Cap connects to grid.
VT25A	7.5	ER3-2000	30	------	B	3	50	
25A6	25.0	HS5-3480	43	------	B	3	58	
25A7	25.0	HS5-3486	50	------	B	3	45	Pentode sect.
25A7	25.0	HS0-6013	0	57	A	7	40	Rectifier sect.
25AC5	25.0	HS5-3080	0	------	B	3	38	
25AV5	25.0	HS1-5830	50	------	C	3	49	
25AX4	25.0	HY0-5030	0	54	A	7	40	
25B5	25.0	GR4-2350	0	------	B	3	63	
25B6	25.0	HS5-3480	52	------	C	3	50	
25B8	25.0	HS0-3410	22	------	B	3	50	Pentode sect. Cap connects to grid.
25B8	25.0	HS8-5060	10	------	B	3	38	Triode sect.
25BK5	25.0	EV8-1860	0	------	D	3	28	
25BQ6	25.0	HS5-0480	50	------	C	3	56	Cap connects to plate.
25C5	25.0	ET2-7610	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
25C6	25.0	HS5-3480	33	------	D	3	30	
25CA5	25.0	ET2-7610	25	------	D	3	30	
25CD6	25.0	HS5-0830	42	------	D	3	33	Cap connects to plate.
25CU6	25.0	HS5-0480	50	------	C	3	56	Cap connects to plate.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
25D8	25.0	HS0-3410	18	------	B	3	48	Pentode sect. Cap connects to grid.
25D8	25.0	HS5-6010	0	------	B	3	28	Triode sect.
25D8	25.0	HS5-8010	0	33	A	2	40	Diode sect.
25DK4	25.0	ET0-5070	0	65	A	7	40	
25DN6	25.0	HS5-0830	28	------	D	(#)	45	Cap connects to plate.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
25DQ6	25.0	HS5-0480	36	------	D	3	30	Cap connects to plate.
25DT5	25.0	EV3-9170	31	------	C	3	60	
25EC6	25.0	HS5-0830	50	------	D	3	30	Cap connects to plate.
25EH5	25.0	ET2-7610	31	------	C	3	50	
25F5	25.0	ET2-7610	35	------	C	3	50	
25L6	25.0	HS5-3481	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
25N6	25.0	HS5-3480	0	------	B	3	63	
25T	6.3	ER3-0000	0	------	B	3	35	Cap connects to plate.
25W4	25.0	HY0-5030	0	63	A	7	40	
25W6	25.0	HS5-3480	56	------	C	3	38	
25Y5	25.0	GR0-5040	0	33	A	7	40	Plate No. 1.
25Y5	25.0	GR0-2030	0	33	A	7	40	Plate No. 2.
25Z5	25.0	GR0-5040	0	60	A	7	40	Plate No. 1.
25Z5	25.0	GR0-2030	0	60	A	7	40	Plate No. 2.
25Z5MG	25.0	HS0-5080	0	60	A	7	40	Plate No. 1.
25Z5MG	25.0	HS0-3040	0	60	A	7	40	Plate No. 2.
25Z6	25.0	HS0-5081	0	60	A	7	40	Plate No. 1.
25Z6	25.0	HS0-3041	0	60	A	7	40	Plate No. 2.
26	1.5	ER3-2000	43	------	B	3	29	
26A6	25.0	ET1-5672	9	------	C	3	50	
26A7	25.0	HW1-8523	11	------	D	(#)	28	Pentode No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
26A7	25.0	HW3-4521	11	------	D	(#)	28	Pentode No. 2.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
26BK6	25.0	ET1-7025	6	------	B	3	32	Triode sect.
26BK6	25.0	ET0-6025	0	40	A	2	40	Diode No. 1.
26BK6	25.0	ET0-5027	0	40	A	2	40	Diode No. 2.
26C6	25.0	ET1-7020	18	------	B	3	48	Triode sect.
26C6	25.0	ET1-6020	0	14	A	2	40	Diode No. 1.
26C6	25.0	ET1-5020	0	14	A	2	40	Diode No. 2.
26D6	25.0	ET7-5621				Short test only.		
26D6	25.0	ET1-6027	17	------	D	3	36	
26E6	25.0	HS5-3480	30	------	D	3	30	
26E6WG	25.0	HS5-3480	45	------	D	3	28	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
26Z5W	25.0	EV0-6080	0	50	A	7	40	Plate No. 1.
26Z5W	25.0	EV0-1030	0	50	A	7	40	Plate No. 2.
27	2.5	FR3-2040	41	------	B	3	25	
27S	2.5	FR3-2040	41	------	B	3	25	
28D7	25.0	JR7-5362	20	------	D	(#)	17	Pentode No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
28D7	25.0	JR2-4367	20	------	D	(#)	17	Pentode No. 2.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
30	2.0	ER3-2000	40	------	B	3	23	
31	2.0	ER3-2000	65	------	B	3	23	
32	2.0	ER0-2300	19	------	B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
32ET5	35.0	ET2-7610	37	------	C	3	54	Make LINE TEST at 56.
32L7	35.0	HS5-3480	34	------	C	3	60	Pentode sect.
32L7	35.0	HS0-6013	0	60	A	7	40	Diode sect.
33	2.0	FR3-2400	35	------	B	3	36	
RK33	6.3	HR4-5060	38	------	B	3	34	Triode No. 1.
RK33	6.3	HR0-3020	38	------	B	3	34	Triode No. 2. Cap connects to grid.
34	2.0	ER0-2300	17	------	B	(#)	15	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
34GD5	35.0	ET2-7610	38	------	C	3	60	
RK34	6.3	HR3-0040	18	------	C	3	33	Triode No. 1. Right cap connects to plate.
RK34	6.3	HR5-0040	18	------	C	3	33	Triode No. 2. Left cap connects to plate.
35	2.5	FR0-2340	24	------	B	3	26	Cap connects to grid.
35A5	35.0	JR6-2370	33	------	D	3	30	
35B5	35.0	ET1-5620	32	------	D	3	23	
35C5	35.0	ET2-7610	32	------	D	3	23	
35CD6	35.0	HS5-0830	42	------	D	3	33	Cap connects to plate.
35DZ8	35.0	EV3-6720	24	------	D	3	30	Pentode sect.
35DZ8	35.0	EV1-9080	26	------	B	3	15	Triode sect.
35EH5	35.0	ET2-7610	10	------	D	3	35	
35GL6	35.0	ET2-7510	35	------	D	3	32	
35HB8	35.0	EV9-7680	30	------	C	3	46	Pentode sect.
35HB8	35.0	EV1-3020	30	------	B	3	17	Triode sect.
35L6	35.0	HS5-3480	33	------	D	3	30	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
35W4	BLST	ET0-1670	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
35W4	35.0	ET0-5070	0	65	A	7	40	Rectifier sect.
35Y4	BLST	JR0-2470	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
35Y4	35.0	JR0-2070	0	65	A	7	40	Rectifier sect.
35Z3	35.0	JR0-2070	0	65	A	7	40	
35Z4	35.0	HS0-5080	0	65	A	7	40	
35Z5	BLST	HS0-5380	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
35Z5	35.0	HS0-5080	0	65	A	7	40	Rectifier sect.
35Z6	35.0	HS0-5080	0	65	A	7	40	Plate No. 1.
35Z6	35.0	HS0-3040	0	65	A	7	40	Plate No. 2.
36	6.3	FR0-2340	24	------	B	3	26	Cap connects to grid.
36AM3	35.0	ET0-5070	0	40	A	7	50	
37	6.3	FR3-2040	41	------	B	3	23	
38	6.3	FR0-2340	39	------	B	3	26	Cap connects to grid.
38A3	35.0	EV0-1030	0	------	A	7	40	
39/44	6.3	FR0-2340	28	------	B	3	25	Cap connects to grid.
T40	7.5	ER3-0000	0	------	B	3	30	Cap connects to plate.
40	5.0	ER3-2000	32	------	B	8	55	
40FR5	35.0	ET2-7610	40	------	C	3	52	
40Z5	BLST	HS0-5380	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
40Z5	50.0	HS0-5080	0	65	A	7	40	
41	6.3	GR4-2350	34	------	B	3	40	
42	6.3	GR4-2350	29	------	B	3	50	
43	25.0	GR4-2350	43	------	B	3	58	
45	2.5	ER3-2000	61	------	B	3	47	
45Z3	50.0	HR0-2040	0	58	A	7	40	
45Z5	BLST	HS0-5380	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
45Z5	50.0	HS0-5080	0	65	A	7	40	Rectifier sect.
46	2.5	FR3-2400	30	------	B	3	50	
47	2.5	FR3-2400	22	------	B	3	50	
48	25.0	GR4-2350	58	------	B	3	50	
49	2.0	FR3-2400	49	------	B	3	28	
50	7.5	ER3-2000	61	------	B	3	38	
50A5	50.0	JR6-2370	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
50AX6	50.0	HS0-5080	0	65	A	7	40	Plate No. 1.
50AX6	50.0	HS0-3040	0	65	A	7	40	Plate No. 2.
50B5	50.0	ET1-5620	10	------	D	(#)	45	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
50BK5	50.0	EV3-1860	0	------	D	3	28	
50C5	50.0	ET2-7610	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
50C6	50.0	HS5-3481	33	------	D	3	30	
50CD6	50.0	HS5-0830	42	------	D	3	33	Cap=P.
50DC4	50.0	ET0-5070	0	44	A	7	60	
50EH5	50.0	ET2-7610	31	------	C	3	50	
50FA5	50.0	ET2-7610	38	------	C	3	65	
50FE5	50.0	HS5-3480	45	------	D	3	60	
50FK5	50.0	ET2-7610	27	------	C	2	60	
50FY8	50.0	EV3-6720	20	------	D	3	31	Pentode sect.
50FY8	50.0	EV1-9080	30	------	B	3	23	Triode sect.
50L6	50.0	HS5-3480	10	------	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
50X6	50.0	JR0-6075	0	60	A	7	40	Plate No. 1.
50X6	50.0	JR0-3025	0	60	A	7	40	Plate No. 2.
50Y6	50.0	HS0-5080	0	60	A	7	40	Plate No. 1.
50Y6	50.0	HS0-3040	0	60	A	7	40	Plate No. 2.
50Y7	BLST	HS0-0600	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
50Y7	50.0	HS0-5080	0	60	A	7	40	Plate No. 1.
50Y7	50.0	HS0-3040	0	60	A	7	40	Plate No. 2.
50Z7	BLST	HS0-0600	----	------	------	------	------	Short on 1, 2, 3, 4, and 5.
50Z7	50.0	HS0-5080	0	60	A	7	40	Plate No. 1.
50Z7	50.0	HS0-3040	0	60	A	7	40	Plate No. 2.
HD51	BLST	AP0-1020	0	32	A	4	40	Short on 1, 2, 3, 4, and 5.
51/51S	2.5	FR0-2340	24	------	B	3	26	Cap connects to grid
52	6.3	FR3-2400	33	------	C	3	30	
53	2.5	HR5-6042	12	------	B	3	38	Triode No. 1.
53	2.5	HR3-2046	12	------	B	3	38	Triode No. 2.
55	2.5	GR0-2050	39	------	B	3	24	Triode sect. Cap connects to grid.
55	2.5	GR0-4050	0	14	A	2	40	Diode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
55	2.5	GR0-3050	0	14	A	2	40	Diode No. 2.
56	2.5	FR3-2040	29	———	B	3	37	
57	2.5	GR0-2354	21	———	B	3	31	Cap connects to grid No. 1.
57A	6.3	GR0-2354	21	———	B	3	31	Cap connects to grid.
58	2.5	GR0-2354	24	———	B	3	36	Cap connects to grid No. 1.
58A/58AS	6.3	GR0-2354	24	———	B	3	36	Cap connects to grid.
59	2.5	HR4-2365	22	———	B	3	50	
60FX5	50.0	ET2-7610	15	———	D	3	31	
HY65	6.3	HS5-0408	0	———	C	3	38	Cap connects to plate.
KT-66	6.3	HS5-3481	15	———	D	3	32	
VT67	2.0	ER3-2000	40	———	B	3	23	
HY69	6.3	FR3-0240	0	———	C	3	38	Cap connects to plate.
70A7	75.0	HS5-3480	50	———	C	3	38	Pentode sect.
70A7	75.0	HS0-1000	0	65	A	(#)	40	Rectifier sect.
#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.								
70L7	75.0	HS5-3460	41	———	C	3	63	Pentode sect.
70L7	75.0	HS0-8013	0	65	A	7	40	Rectifier sect.
71A	5.0	ER3-2000	73	———	B	3	42	
72	2.5	ER0-0000	0	80	A	4	40	Cap connects to plate.
75	6.3	GR0-2050	11	———	B	3	19	Triode sect. Cap connects to grid.
75	6.3	GR0-4052	0	14	A	2	40	Diode No. 1.
75	6.3	GR0-3052	0	14	A	2	40	Diode No. 2.
75MG	6.3	HS0-4080	11	———	B	3	19	Triode sect. Cap connects to grid.
75MG	6.3	HS0-5080	0	14	A	2	40	Diode No. 1.
75MG	6.3	HS0-6080	0	14	A	2	40	Diode No. 2.
76	6.3	FR3-2040	29	———	B	3	36	
77	6.3	GR0-2354	21	———	B	3	31	Cap connects to grid.
78	6.3	GR0-2354	24	———	B	3	36	Cap connects to grid No. 1.
79	6.3	GR0-5040	15	———	B	3	25	Triode No. 1. Cap connects to grid.
79	6.3	GR3-2040	15	———	B	3	25	Triode No. 2.
80	5.0	ER0-3000	0	0	A	7	40	Plate No. 1.
80	5.0	ER0-2000	0	0	A	7	40	Plate No. 2.
81	7.5	ER0-2000	0	40	A	6	40	
82	2.5	ER0-3000	0	70	A	7	40	Plate No. 1.
82	2.5	ER0-2000	0	70	A	7	40	Plate No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
83	5.0	ER0-3000	0	66	A	7	40	Plate No. 1.
83	5.0	ER0-2000	0	63	A	7	40	Plate No. 2.
83V	5.0	ER0-3000	0	60	A	7	40	Plate No. 1.
83V	5.0	ER0-2000	0	60	A	7	40	Plate No. 2.
84	6.3	FR0-3040	0	46	A	7	40	Plate No. 1.
84	6.3	FR0-2040	0	46	A	7	40	Plate No. 2.
85	6.3	GR0-2050	39		B	3	25	Triode sect. Cap connects to grid.
85	6.3	GR0-4052	0	14	A	2	40	Diode No. 1.
85	6.3	GR0-3052	0	14	A	2	40	Diode No. 2.
85AS	6.3	GR0-2050	28		B	3	28	Triode sect. Cap connects to grid.
85AS	6.3	GR0-4052	0	14	A	2	40	Diode No. 1.
85AS	6.3	GR0-3052	0	14	A	2	40	Diode No. 2.
89/89Y	6.3	GR0-2354	37		B	3	39	Cap connects to grid.
99	3.0	ER3-2000	55		B	3	11	
101D	4.3	ER3-2000	55		B	3	28	
101F	4.3	ER3-2000	53		B	3	28	
102D	2.0	ER3-2000	25		B	3	13	
102F	2.0	ER3-2000	25		B	3	14	
104D	4.3	ER3-2000	75		B	3	28	
CK108	6.3	GR0-2354	21		B	3	31	Cap connects to grid.
112A	5.0	ER3-2000	44		B	3	42	
CK113	50.0	HS5-3486	48		B	3	45	Pentode sect.
CK113	50.0	HS0-6010	0	57	A	7	40	Rectifier sect.
HY114	1.5	HS0-0000	19		B	3	28	Right cap connects to plate. Left cap connects to grid.
KT88	6.3	HS5-3481	12		D	3	44	
117L7	117.0	HS4-3580	37		C	3	50	Pentode sect.
117L7	117.0	HS0-6010	0	65	A	7	40	Rectifier sect.
117M7	117.0	HS4-3580	37		C	3	50	Pentode sect.
117M7	117.0	HS0-6010	0	65	A	7	40	Rectifier sect.
117N7	117.0	HS4-3560	37		D	3	25	Pentode sect.
117N7	117.0	HS0-8000	0	71	A	(#)	40	Rectifier sect.

#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.

117P7	117.0	HS4-3560	37		C	3	50	Pentode sect.
117P7	117.0	HS0-8000	0	71	A	(#)	40	Rectifier sect.

#Hold down pushbutton 8-METER REV. and press pushbutton 7-RECT.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
117Z3	117.0	ET0-5060	0	65	A	7	40	
117Z4	117.0	HS0-5080	0	65	A	7	40	
117Z6	117.0	HS0-5080	0	65	A	7	40	Plate No. 1.
117Z6	117.0	HS0-3040	0	65	A	7	40	Plate No. 2.
X-155	6.3	EV7-6089	16	.....	D	3	30	Triode No. 1.
X-155	6.3	EV2-1039	16	.....	D	3	30	Triode No. 2.
C182	5.0	ER3-2000	83	.....	B	3	25	
C182A	5.0	ER3-2000	79	.....	B	3	38	
182B	5.0	ER3-2000	58	.....	B	3	38	
183	5.0	ER3-2000	79	.....	B	3	38	
205F	5.0	ER3-2000	34	.....	B	3	37	
231D	3.0	ER3-2000	49	.....	B	3	14	
244A	2.0	FR3-2040	42	.....	B	3	23	
245A	2.0	FR0-2340	55	.....	B	3	18	Cap connects to grid.
247A	2.0	FR3-2040	33	.....	B	3	23	
TS251	50.0	HS5-3486	50	.....	B	3	45	Pentode sect.
TS251	50.0	HS0-6013	0	57	A	7	40	Rectifier sect.
257A	3.0	ER0-2000	49	.....	B	3	14	Cap connects to grid.
259A	2.0	FR0-2340	33	.....	B	3	28	Cap connects to grid.
262B	10.0	ER0-2030	31	.....	B	3	25	Cap connects to grid.
264B	1.5	ER3-2000	49	.....	B	3	14	
264C	1.5	ER3-2000	54	.....	B	3	14	
271A	5.0	FR3-2040	32	.....	C	3	36	
272A	10.0	FR3-2040	51	.....	B	3	24	
274A	5.0	ER0-2000	0	26	A	7	40	Plate No. 1.
274A	5.0	ER0-3000	0	26	A	7	40	Plate No. 2.
274B	5.0	JS0-6000	0	26	A	7	40	Plate No. 1.
274B	5.0	JS0-4000	0	26	A	7	40	Plate No. 2.
275A	5.0	ER3-2000	68	.....	C	3	34	
283A	2.0	FR0-2340	28	.....	B	3	25	Cap connects to grid.
285A	2.0	FR0-2304	40	.....	B	3	23	Cap connects to grid.
286A	2.0	GR0-2354	31	.....	B	3	23	Cap connects to grid.
290A	10.0	GR0-2354	31	.....	B	3	26	Cap connects to grid.
291A	10.0	HR5-3462	44	.....	B	3	25	Cap connects to grid.
292A	10.0	GR0-2050	36	.....	B	3	16	Triode sect. Cap connects to grid.
292A	10.0	GR0-4052	0	28	A	2	40	Diode No. 1.
292A	10.0	GR0-3052	0	28	A	2	40	Diode No. 2.
293A	10.0	GR4-2350	43	.....	B	3	26	
294A	10.0	FR0-2340	43	.....	B	3	26	Cap connects to grid.
300B	5.0	ER3-2000	60	.....	C	3	58	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
303A	2.0	GR0-2050	36	———	B	3	16	Triode sect. Cap connects to grid.
303A	2.0	GR0-4052	0	0	A	2	40	Diode No. 1.
303A	2.0	GR0-3052	0	0	A	2	40	Diode No. 2.
307A	5.0	FR3-0204	32	———	B	3	64	Cap connects to plate.
309A	10.0	FR0-2340	31	———	B	3	23	Cap connects to grid.
310A	10.0	GR0-2354	26	———	B	3	30	Cap connects to grid.
310B	10.0	GR0-2354	26	———	B	3	30	Cap connects to grid.
311A	10.0	FR0-2340	38	———	C	3	30	Cap connects to grid.
313CA	———	AP4-2010	0	80	A	4	40	
328A	7.5	GR0-2354	16	———	B	3	44	Cap connects to grid
329A	7.5	FR0-2340	38	———	C	3	31	Cap connects to grid
336A	10.0	GR4-2350	10	———	D	3	16	
337A	10.0	GR0-2354	30	———	B	3	21	Cap connects to grid.
338A	10.0	BV3-2040	(#)	89	A	4	40	
#Should strike between settings 50 and 40 of the BIAS dial.								
339A	5.0	FR3-0240	0	———	C	3	40	Cap connects to plate.
347A	6.3	HS0-4080	30	———	B	3	23	Cap connects to grid.
348A	6.3	HS0-3485	13	———	B	3	45	Cap connects to grid.
349A	6.3	HS5-3480	10	———	D	3	20	
350A	6.3	FR3-0240	21	———	D	3	32	Cap connects to plate
350B	6.3	HS5-3480	25	———	D	3	31	
351A	6.3	HS0-5081	0	55	A	7	40	Plate No. 1.
351A	6.3	HS0-3081	0	55	A	7	40	Plate No. 2.
352A	10.0	GR0-2050	36	———	B	3	16	Triode sect. Cap connects to grid.
352A	10.0	GR0-4050	0	28	A	2	40	Diode No. 1.
352A	10.0	GR0-3050	0	28	A	2	40	Diode No. 2.
367A	6.3	HV6-2480	28	———	D	3	30	
373A	2.0	HS4-8603	13	———	B	3	25	
374A	3.0	HS4-8603	40	———	D	3	14	
375A	20.0	HS5-3480	53	———	C	3	47	
381A	6.3	JS0-5010	0	49	A	2	40	Diode.
383A	6.3	JS4-6010	25	———	D	3	14	
385A	6.3	JS5-0318	15	———	D	3	12	Cap connects to plate.
387A	6.3	JS5-0318	15	———	D	3	16	Cap connects to plate.
393A	3.0	JR4-0000	(#)	90	A	4	40	Cap connects to plate.
#Should strike between settings 36 and 26 of the BIAS dial.								
396A	6.3	KR7-6082	17	———	D	3	26	Triode No. 1.
396A	6.3	KR3-4028	17	———	D	3	26	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
398A	6.3	HS4-8603	35	------	D	3	27	
399A	1.1	BX6-2300	9	------	B	(#)	18	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
400A	1.1	BX4-3062	50	------	B	3	25	
401A	6.3	ET1-5670	12	------	B	(#)	50	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
403A	6.3	ET1-5620	10	------	D	3	22	
403B	6.3	ET1-5620	10	------	D	3	21	
407A	20.0	KR7-6082	17	------	D	3	26	Triode No. 1.
407A	20.0	KR3-4028	17	------	D	3	26	Triode No. 2.
408A	20.0	ET1-5620	10	------	D	3	22	
409A	6.3	ET1-5627	14	------	B	3	44	
412A	6.3	EV0-9070	0	59	A	7	40	Plate No. 1.
412A	6.3	EV0-1030	0	59	A	7	40	Plate No. 2.
420	2.5	ER0-3000	0	70	A	7	40	Plate No. 1.
420	2.5	ER0-2000	0	70	A	7	40	Plate No. 2.
420A	12.6	EV6-8073	0	------	B	3	25	Triode No. 1.
420A	12.6	EV3-1026	0	------	B	3	25	Triode No. 2.
421A	6.3	HY4-5062	63	------	D	3	40	Triode No. 1.
421A	6.3	HY1-2035	63	------	D	3	40	Triode No. 2.
422A	5.0	JS0-6000	0	63	A	7	40	Plate No. 1.
422A	5.0	JS0-4000	0	63	A	7	40	Plate No. 2.
446A	6.3	HS0-0080	0	------	C	3	30	Cap connects to plate. Ring connects to grid.
482A	5.0	ER3-2000	79	------	B	3	38	
482B	5.0	ER3-2000	57	------	B	3	38	
483	5.0	ER3-2000	70	------	B	3	34	
484	3.0	FR3-2040	37	------	B	3	33	
484A	3.0	FR3-2040	37	------	B	3	33	
485	3.0	FR3-2040	37	------	B	3	33	
486	3.0	FR3-2040	43	------	B	3	11	
GL502	6.3	HS5-3680	(#)	62	A	7	40	
#Should strike between settings 80 and 70 of the BIAS dial.								
CK502AX	1.1	DV4-1200	18	------	B	(#)	15	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK503AX	1.1	DV4-1200	30	------	B	(#)	6	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK505AX	0.6	DV4-1200	0	------	B	(#)	4	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK506AX	1.1	DV4-1200	33	------	B	(#)	13	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK510AX	0.6	EX1-2300	0	0	A	4	4	Sect. No. 1.
CK510AX	0.6	EX6-5300	0	0	A	4	4	Sect. No. 2.
CK512AX	0.6	DV4-1200	30	0	A	4	20	
CK518AX	1.1	DV4-1200	45	0	A	4	40	
CK522AX	1.1	DV4-1200	38	0	A	4	40	
CK523AX	1.1	DV4-1200	47	0	A	4	40	
CK524AX	1.1	DV4-1200	76	0	A	4	40	
CK525AX	1.1	DV4-1200	48	0	A	4	40	
CK526AX	1.1	DV4-1200	59	0	A	4	40	
CK527AX	1.1	DV4-1200	32	0	A	4	20	
CK528AX	1.1	DV4-1200	37	0	A	4	40	
CK529AX	1.1	DV4-1200	67	0	A	4	40	
CK533AX	1.1	DV4-1200	40	0	A	4	38	
CK535AX	1.1	DV4-1200	67	0	A	4	40	
CK541DX	1.1	DV4-1200	41	0	A	4	12	
CK542DX	1.1	DV4-2100	19	0	A	2	12	
CK543DX	0.6	DV4-2100	0	0	A	2	15	
CK544DX	1.1	DV4-1200	30	0	A	4	20	
GL546	6.3	ET1-7520	(#)	60	A	7	40	
#Should strike between settings 80 and 70 of the BIAS dial.								
CK547DX	1.1	DV4-1200	41	0	A	4	12	
CK548DX	1.1	DV4-1200	56	0	A	4	12	
CK551AX	1.1	EW5-1200	20	------	B	(#)	10	Pentode sect.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK551AX	1.1	EW0-3000	0	0	A	2	6	Diode sect.
CK553AX	1.1	DV4-1200	0	------	B	(#)	10	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CK556AX	1.1	ES3-1000	37	------	B	3	25	
559	6.3	HS0-0080	0	63	A	2	40	Diode. Cap connects plate.
CK568AX	1.1	ES3-1000	40	------	B	3	11	
CK569AX	1.1	DV4-1200	24	------	B	3	19	
CK571AX	1.1	DU7-1200	92	------	B	3	4	
CK573AX	1.1	CU3-1000	34	------	B	3	50	
CK574AX	0.6	DV4-2100	0	0	A	2	11	
CK605CX	6.3	DU7-1265	10	------	D	3	22	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
CK606BX	6.3	CT0-1040	0	69	A	2	40	Diode.
CK608CX	6.3	DU5-1060	20	———	D	3	25	
CX619CX	6.3	CT4-1050	5	———	D	3	20	
629	2.5	FR3-2040	(#)	87	A	4	40	
#Should strike between settings 37 and 27 of the BIAS dial.								
713A	6.3	HS4-8630	0	———	C	3	44	
717A	6.3	HS4-8630	16	———	D	3	18	
801A	7.5	ER3-2000	0	———	B	3	38	
802A	6.3	HR4-0365	22	———	B	3	50	Cap connects to plate.
807	6.3	FR3-0240	33	———	C	3	48	Cap connects to plate.
809	6.3	ER3-0000	0	———	B	3	42	Cap connects to plate.
811	6.3	ER3-0000	0	———	B	3	36	Cap connects to plate.
812	6.3	ER3-0000	0	———	B	3	56	Cap connects to plate.
814	10.0	FR3-0240	0	———	C	3	38	Cap connects to plate.
815	6.3	BV2-0437	31	———	C	3	50	Pentode No. 1. Right cap connects to plate.
815	6.3	JV7-0432	31	———	C	3	50	Pentode No. 2. Left cap connects to plate. Short on 3.
816	2.5	ER0-0000	0	69	A	7	40	Cap connects to plate.
SD828A*	6.3	EW3-1520	18	———	D	3	16	E basing.
SD828E*	6.3	EW3-0512	17	———	D	3	15	E basing. Top lead connects to plate.
829B	6.3	HS4-5613	0	———	D	3	20	Plate No. 1.
			Use adapter E105.					
829B	6.3	HS4-8613	0	———	D	3	20	Plate No. 2.
			Use adapter E105.					
832A	6.3	HS4-5613	0	———	C	3	44	Plate No. 1.
			Use adapter E105.					
832A	6.3	HS4-8613	0	———	C	3	44	Plate No. 2.
			Use adapter E105.					
834	7.5	ER0-0000	0	———	B	3	46	Near cap connects to grid. Far cap connects to plate.
836	3.0	ER0-0000	0	56	A	7	40	Cap connects to plate.
837	12.6	HR4-0365	0	———	C	3	50	Cap connects to plate.
841	7.5	ER3-2000	0	———	B	3	25	
842	7.5	ER3-2000	61	———	B	3	80	
843	2.5	FR3-2040	12	———	B	3	42	
864	1.1	ER3-2000	45	———	B	3	16	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
865	7.5	ER3-0200	34	———	B	3	16	Cap connects to plate.
866A	3.0	ER0-0000	0	67	A	7	40	Cap connects to plate.
871	2.5	ER0-0000	0	65	A	7	40	Cap connects to plate.
874	———	AP0-3010	0	53	A	4	40	
879	2.5	ER0-0000	0	78	A	4	40	Cap connects to plate.
884	6.3	HS5-3080	(#)	90	A	4	40	
#Should strike between settings 82 and 72 of the BIAS dial.								
885	2.5	FR3-2040	(#)	90	A	4	40	
#Should strike between settings 82 and 72 of the BIAS dial.								
SD917A*	6.3	DU2-1050	31	———	B	3	12	C basing.
SN944*	6.3	EW3-0512	26	———	B	3	33	E basing. Top lead connects to plate.
SN946*	6.3	CT0-1040	0	70	A	2	40	A basing. Diode.
SN947C*	6.3	CU6-1350	54	———	C	3	38	E basing.
SN947D*	6.3	DW1-5780	54	———	C	3	38	F basing.
SN949C*	6.3	DW7-1250	(#)	58	A	7	40	F basing.
#Should strike between settings 80 and 70 of the BIAS dial.								
950	2.0	FR3-2400	45	———	B	3	24	
951	2.0	ER0-2300	18	———	B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
SN953D*	6.3	DW1-5720	25	———	D	3	21	F basing.
954	6.3	GR8-0374	30	———	B	3	18	Cap connects to plate.
SN954*	6.3	ES0-1030	0	40	A	7	40	B basing.
SN954B*	6.3	DW0-2050	0	40	A	7	40	F basing.
955	6.3	GR4-3070	22	———	B	3	48	
SN955B*	6.3	DW1-7084	28	———	B	3	33	F basing. Triode No. 1.
SN955B*	6.3	DW2-5084	28	———	B	3	33	F basing. Triode No. 2.
956	6.3	GR8-0374	30	———	B	3	31	Cap connects to plate.
SN956B	1.1	BS0-0000	0	0	A	7	4	Top lead connects to plate.
957	1.5	GR4-3000	28	———	B	3	16	
SN957A*	6.3	FT4-1020	36	———	B	3	30	D basing.
958	1.5	GR4-3000	41	———	B	3	30	
958A	1.1	GR4-3000	45	———	B	3	16	
959	1.5	GR8-0300	25	———	B	(#)	15	Cap connects to plate.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
SN972D*	6.3	DW1-5740	21	———	B	3	50	F basing.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
SN973B*	6.3	GT1-5740	22	.....	C	3	31	F basing.
SN976C*	6.3	DW1-5740	49	.....	C	3	50	F basing.
SD933C*	6.3	DW1-8050	20	.....	D	3	29	F basing.
SD995B*	6.3	DW1-5740	21	.....	B	3	50	F basing.
FM1000	6.3	JR2-4536	12	.....	B	3	38	Grid No. 1.
FM1000	6.3	JR6-4532	12	.....	B	3	38	Grid No. 2.
1003	.....	HS0-5080	0	70	A	6	40	Plate No. 1.
#Hold down pushbutton 6-0Z4 for 5 seconds.								
1003	.....	HS0-3080	0	70	A	6	40	Plate No. 2.
#Hold down pushbutton 6-0Z4 for 5 seconds.								
CK1005	6.3	GY0-3050	0	89	A	4	40	Plate No. 1.
CK1005	6.3	GY0-5030	0	89	A	4	40	Plate No. 2.
SN1006*	6.3	FT4-1020	28	.....	B	3	12	D basing.
1007	1.1	HY0-3010	0	48	A	6	40	Plate No. 1.
1007	1.1	HY0-5010	0	48	A	6	40	Plate No. 2.
CK1027	.....	AP0-4070	0	83	A	4	40	Cap connects to plate.
CK1042	.....	AP0-1050	0	35	A	6	40	
E1148	6.3	HS0-0080	14	.....	B	3	56	Right cop connects to plate. Left cap connects to grid.
1201	6.3	JS1-3040	15	.....	B	3	38	
1203	6.3	JR0-4070	0	52	A	2	40	Diode.
1204	6.3	HS5-3140	10	.....	B	3	46	
1206	6.3	JR5-7362	10	.....	B	3	53	Tetrode No. 1.
1206	6.3	JR4-2367	10	.....	B	3	53	Tetrode No. 2.
1222	6.3	GR4-2378	23	.....	D	3	25	
1229	2.0	ER0-2300	19	.....	B	(#)	16	Cap connects to grid.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1230	2.0	ER3-2000	40	.....	B	3	23	
1231	6.3	JR6-2374	0	.....	C	3	32	
1232	6.3	JR6-2374	18	.....	B	3	50	
1237	2.5	HS0-3000	0	76	A	7	40	Plate No. 1. Short on 1, 2, 3, 4, and 5.
1237	2.5	HS0-6000	0	76	A	7	40	Plate No. 2. Short on 1, 2, 3, 4, and 5.
1247*	0.6	EV0-0000	0	0	A	2	40	F basing. Top lead connects to plate.
HY1269	12.6	FR3-0240	0	.....	C	3	50	Cap connects to plate. Short on 3.
1273	6.3	JR6-2374	11	.....	B	3	58	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
1274	6.3	HS0-5083	0	42	A	7	40	Plate No. 1.
1274	6.3	HS0-3085	0	42	A	7	40	Plate No. 2.
1280	12.6	JR6-2374	22	———	B	3	33	
1282	6.3	JR6-2375	10	———	D	3	18	
1284	12.6	JR6-2374	28	———	B	3	50	
1285	25.0	HS5-3480	36	———	D	3	29	
1291	2.5	JR6-7000	12	———	B	3	38	Triode No. 1.
1291	2.5	JR3-2000	25	———	B	3	38	Triode No. 2.
1293	1.5	JR6-2000	30	———	B	3	33	
1294	1.5	JR0-4070	0	27	A	2	40	Diode.
1299	2.5	JR6-2300	37	———	B	3	52	
SR1553D	6.3	ET2-1050	0	———	D	3	38	
1602	7.5	ER3-2000	39	———	B	3	32	
1603	6.3	GR0-2354	21	———	B	3	31	Cap connects to grid.
1609	1.1	FR3-2400	0	———	B	(#)	18	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1610	2.5	FR3-2400	22	———	B	3	50	
1611	6.3	HS5-3481	29	———	B	3	50	
1612	6.3	HS0-3485	23	———	B	3	16	Cap connects to grid.
1612	6.3	HS5-3481	27	———	B	3	16	Pin grid.
1613	6.3	HS5-3480	0	———	B	3	56	
1614	6.3	HS5-3481	23	———	D	3	25	
1616	3.0	ER0-0000	0	46	A	6	40	Cap connects to plate.
1619	2.5	HS5-3408	12	———	C	3	43	
1620	6.3	HS0-3485	22	———	B	3	31	Cap connects to grid.
1621	6.3	HS5-3480	29	———	B	3	50	
1622	6.3	HS5-3480	23	———	D	3	25	
1623	6.3	ER3-0000	0	———	B	3	56	Cap connects to plate.
1624	2.5	FR3-0000	17	———	C	3	50	Cap connects to plate.
1625	12.6	HR4-0360	33	———	C	3	40	Cap connects to plate.
1626	12.6	HS5-3080	52	———	B	3	53	
1629	12.6	HS5-4080	0	100	A	3	———	Eye open.
1629	12.6	HS5-4380	0	100	A	3	———	Eye closed.
1631	12.6	HS5-3481	23	———	D	3	25	
1632	12.6	HS5-3480	10	———	D	(#)	45	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
1633	25.0	HY4-5060	23	———	B	3	50	Triode No. 1.
1633	25.0	HY1-2030	23	———	B	3	50	Triode No. 2.
1634	12.6	HY4-5061	0	———	B	3	25	Triode No. 1
1634	12.6	HY3-2061	0	———	B	3	25	Triode No. 2.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
1635	6.3	HS4-3080	0	.....	B	3	22	Triode No. 1.
1635	6.3	HS5-6080	0	.....	B	3	22	Triode No. 2.
1641	5.0	ER0-0000	0	0	A	7	50	Left cap is the plate.
1641	5.0	BU0-0000	0	0	A	7	50	Right cap is the plate.
1642	6.3	HR4-5060	38	.....	B	3	34	Triode No. 1.
1642	6.3	HR0-3020	38	.....	B	3	34	Triode No. 2. Cap connects to grid.
1644	12.6	HW1-8523	10	.....	B	3	54	Pentode No. 1.
1644	12.6	HW3-4521	10	.....	B	3	54	Pentode No. 2.
1650	6.3	GR4-3070	22	.....	B	3	48	
1654	1.5	BX0-0000	0	56	A	4	32	Cap connects to plate.
1655	6.3	HY4-5062	0	.....	B	3	25	Triode No. 1.
1655	6.3	HY3-2065	0	.....	B	3	25	Triode No. 2.
1657	6.3	HS5-3068	(#)	90	A	4	40	
#Should strike between settings 43 and 33 of the BIAS dial.								
1658	2.0	ER3-2000	40	.....	B	3	23	
1659	2.5	GR0-2050	11	.....	B	3	19	Triode sect. Cap connects to grid.
1659	2.5	GR0-4050	0	14	A	2	40	Diode No. 1.
1659	2.5	GR0-3050	0	14	A	2	40	Diode No. 2.
1662	2.5	BX4-2300	33	.....	B	3	50	
1851	6.3	HS0-3485	10	.....	D	3	25	Cap connects to grid.
1852	6.3	HS4-8653	10	.....	D	3	30	
1853	6.3	HS4-8653	0	.....	C	3	44	
2050	6.3	HS5-3068	(#)	90	A	4	40	
#Should strike between settings 43 and 33 of the BIAS dial.								
2051	6.3	HS5-3068	(#)	90	A	4	40	
#Should strike between settings 43 and 33 of the BIAS dial.								
5516	6.3	HS5-0310	20	.....	C	3	50	Cap connects to plate. Short on 3.
5517	BLST	AP0-4070	0	44	A	6	40	Cap connects to plate.
5556	4.3	ER3-2000	26	.....	B	3	25	
5590	6.3	ET1-5670	12	.....	B	(#)	50	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
5591	6.3	ET1-5620	10	.....	D	3	21	
5603	6.3	HS4-8603	35	.....	D	3	27	
5608A	2.5	HR5-6042	12	.....	B	3	38	Triode No. 1.
5608A	2.5	HR3-2046	12	.....	B	3	38	Triode No. 2.
5610	6.3	ET6-1020	27	.....	C	3	50	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5618	6.3	BX6-2340	24	———	C	3	38	
5633*	6.3	EW3-0512	26	———	B	3	33	E basing. Top lead connects to plate.
5634*	6.3	EW3-0512	17	———	D	3	15	E basing. Top lead connects to plate.
5635*	6.3	DW1-7084	28	———	B	3	33	F basing. Triode No. 1.
5635*	6.3	DW2-5084	28	———	B	3	33	F basing. Triode No. 2.
5636	6.3	DW1-5724	22	———	B	3	33	Grid No. 1.
5636	6.3	DW4-5721	22	———	B	(#)	12	Grid No. 3.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
5637*	6.3	DU2-1050	31	———	B	3	12	C basing.
5638*	6.3	EW3-1520	18	———	D	3	16	E basing.
5639*	6.3	DW1-5720	25	———	D	3	21	F basing.
5640*	6.3	DW1-5780	54	———	C	3	38	F basing.
5641*	6.3	DW0-2050	0	40	A	7	40	B basing.
5642	1.1	BS0-0000	0	0	A	7	4	Top lead connects to plate.
5643*	6.3	DW7-1250	(#)	58	A	7	40	F basing.
#Should strike between settings 80 and 70 of the BIAS dial.								
5645*	6.3	FT-1020	36	———	B	3	30	D basing.
5646*	6.3	FT4-1020	28	———	B	3	12	D basing.
5647*	6.3	CT0-1040	0	70	A	2	40	A basing. Diode.
5651	———	AP0-1070	0	50	A	4	40	
5654	6.3	ET1-5620	10	———	D	3	22	
5656	6.3	EV2-8193	0	———	C	(#)	43	Tetrode No. 1.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
5656	6.3	EV3-7192	0	———	C	(#)	43	Tetrode No. 2.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
5659	12.6	HS5-3480	22	———	C	3	38	
5660	12.6	HS0-3680	8	———	B	3	34	Pentode sect. Cap connects to grid.
5660	12.6	HS0-5680	0	23	A	2	40	Diode No. 1.
5660	12.6	HS0-4680	0	23	A	2	40	Diode No. 2.
5661	6.3	HS4-8653	21	———	B	3	50	
5662	6.3	ET1-7050	(#)	90	A	4	40	
#Should strike between settings 40 and 30 of the BIAS dial.								

DATA TABLE—Continued

5663	6.3	ET1-7520	(#)	66	A	7	40	

#Should strike between settings 80 and 70 of the BIAS dial.

5670	6.3	KR7-6080	17	———	D	3	26	Triode No. 1.
5670	6.3	KR3-4020	17	———	D	3	26	Triode No. 2.
5672	1.1	DV4-1200	50	———	B	3	16	
5676	1.1	ES3-1000	37	———	B	3	25	
5677	1.1	ES3-1000	40	———	B	3	11	
5678	1.1	DV4-1200	24	———	B	3	19	
5679	6.3	JR0-6075	0	60	A	2	40	Diode No. 1.
5679	6.3	JR0-3025	0	60	A	2	40	Diode No. 2.
5686	6.3	EV2-7630	18	———	C	3	39	
5687	12.6	EV7-9061	23	———	D	3	38	Triode No. 1.
5687	12.6	EV2-1039	23	———	D	3	38	Triode No. 2.
5690	6.3	HW0-5083	0	63	A	7	40	Unit No. 1.
5690	6.3	CR0-3045	0	63	A	7	40	Unit No. 2.
5691	6.3	HY4-5062	0	———	B	3	32	Triode No. 1.
5691	6.3	HY1-2035	0	———	B	3	32	Triode No. 2.
5692	6.3	HY4-5062	23	———	B	3	50	Triode No. 1.
5692	6.3	HY1-2035	23	———	B	3	50	Triode No. 2.
5693	6.3	HS4-8653	22	———	B	3	40	
5694	6.3	HS4-3010	0	———	B	3	50	Triode No. 1.
5694	6.3	HS5-6080	0	———	B	3	50	Triode No. 2.
5696	6.3	ET1-6025	(#)	68	A	7	40	

#Should strike between settings 80 and 70 of the BIAS dial.

5702	6.3	DU7-1265	10	———	D	3	22	
5703	6.3	DU5-1060	20	———	D	3	25	
5704	6.3	CT0-1040	0	69	A	2	40	Diode.
5718*	6.3	DW1-8057	22	———	D	3	28	F basing.
5719*	6.3	DW1-8057	23	———	B	3	20	F basing.
5722	5.0	DU0-1000	0	20	A	2	68	
5725	6.3	ET1-5627	14	———	B	3	44	
A5726	6.3	ET7-5621	20	———	B	3	30	Amplifier sect.
A5726	6.3	ET1-5627	10	———	B	3	38	Oscillator sect.
5726	6.3	ET0-7010	0	70	A	2	40	Diode No. 1.
5726	6.3	ET0-2050	0	70	A	2	40	Diode No. 2.
5727	6.3	ET1-6025	(#)	90	A	4	40	

#Should strike between settings 40 and 30 of the BIAS dial.

5731	6.3	GR4-3074	25	———	B	3	38	
5732	6.3	HS0-3485	19	———	B	3	36	Cap connects to grid.
5742	4.3	ER3-2000	10	———	B	3	21	
5744	6.3	CT4-1050	5	———	D	3	20	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5749	6.3	ET1-5672	9	------	C	3	41	
5750	6.3	ET7-5621			Short test only.			
5750	6.3	ET1-6027	17	------	D	3	36	
5751	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
5751	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
5755	12.6	EV6-8073	0	------	B	3	25	Triode No. 1.
5755	12.6	EV3-1026	0	------	B	3	25	Triode No. 2.
5763	6.3	EV9-1673	8	------	D	3	35	
5784	6.3	DU7-1265	20	------	B	3	45	
5785	1.1	GX0-1000	0	0	A	2	20	
5787	BLST	AP0-3050	0	54	A	4	40	
5812	6.3	ET1-5602	34	------	C	3	54	
5814	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
5814	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
5823	BLST	AP4-1030	100	84	A	4	40	Short on 1, 2, 3, 4, and 5.
5824	25.0	HS5-3480	52	------	C	3	50	
5825	1.5	ER0-0000	0	0	A	4	10	Cap connects to plate.
5829	6.3	DV0-6070	0	63	A	2	40	Diode No. 1.
5829	6.3	DV0-1020	0	63	A	2	40	Diode No. 2.
5838	12.6	HS0-5080	0	0	A	7	50	Plate No. 1.
5838	12.6	HS0-3080	0	0	A	7	50	Plate No. 2.
5839	25.0	HS0-5083	0	30	A	7	40	Plate No. 1.
5839	25.0	HS0-3085	0	30	A	7	40	Plate No. 2.
5840*	6.3	DW1-5740	22	------	C	3	31	F basing.
5842	6.3	DZ4-1060	20	------	E	3	15	TV-7/U, TV-7A/U, TV-7B/U only.
5842	6.3	DZ4-1060	75	0	F	3	15	TV-7D/U only.
5844	6.3	ET5-2070	26	------	C	3	38	Triode No. 1.
5844	6.3	ET6-1070	26	------	C	3	38	Triode No. 2.
5847	6.3	DZ1-6844	15	------	D	3	30	Short on 2 and 3.
5851	2.5	HR8-3600	35	------	B	3	40	
5852	6.3	HS0-5080	0	20	A	7	40	Plate No. 1.
5852	6.3	HS0-3080	0	20	A	7	40	Plate No. 2.
5854	1.1	DV4-1200	45	------	B	3	12	
5875	1.1	DV4-1200	20	20	A	3	50	
5876	6.3	HS3-5060	10					
5879	6.3	EV1-8739	21	------	B	3	25	
5881	6.3	HS5-3481	23	------	D	3	25	
5886	1.1	DU7-2100	34	0	A	2	15	
5894	6.3	HS4-5610	13	------	C	3	50	Plate No. 1.
5894	6.3	HS4-8610	13	------	C	3	50	Plate No. 2.
5896*	6.3	DW0-5074	0	57	A	7	40	F basing. Plate No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5896*	6.3	DW0–1023	0	57	A	7	40	F basing. Plate No. 2.
5897*	6.3	DW1–8050	20	———	D	3	29	F basing.
5899*	6.3	DW1–5740	21	———	B	3	50	F basing.
5900*	6.3	DW1–5740	21	———	B	3	50	F basing.
5902*	6.3	DW1–5720	43	———	C	3	53	F basing.
5903*	25.0	DW0–5074	0	57	A	7	40	F basing. Plate No. 1.
5903*	25.0	DW0–1024	0	57	A	7	40	F basing. Plate No. 2.
5904*	25.0	DW1–8050	43	———	B	3	25	F basing.
5905	25.0	DW1–5720	13	———	D	(#)	13	
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
5906*	25.0	DW1–5720	6	———	D	3	25	F basing.
5907*	25.0	DW1–5720	28	———	B	(#)	80	F basing.
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
5908	25.0	DW1–5724	18	———	D	(#)	11	
		#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.						
5910	1.5	VX6–2300	19	———	B	3	18	
5915	6.3	ET7–5621	20	———	B	3	80	Amplifier sect.
5915	6.3	ET1–5627	10	———	B	3	38	Oscillator sect.
5916	25.0	DW1–5724	22	———	B	3	33	F basing.
5920	6.3	ET5–2070	36	———	C	3	26	Triode No. 1.
5920	6.3	ET6–1070	36	———	C	3	26	Triode No. 2.
5930	2.5	ER3–2000	67	———	C	3	38	
5931	5.0	JS0–6000	0	47	A	7	40	Plate No. 1.
5931	5.0	JS0–4000	0	42	A	7	40	Plate No. 2.
5932	6.3	HS5–3481	23	———	D	3	25	
5933	6.3	FR3–0240	33	———	C	3	48	Cap connects to plate.
5963	12.6	EV7–6080	30	———	B	3	50	Triode No. 1.
5963	12.6	EV2–1030	30	———	B	3	50	Triode No. 2.
5964	6.3	ET5–2076	16	———	D	3	25	Triode No. 1.
5964	6.3	ET6–1075	16	———	D	3	25	Triode No. 2.
5965	12.6	EV7–6081	13	———	D	3	33	Triode No. 1.
5965	12.6	EV2–1036	13	———	D	3	33	Triode No. 2.
5967	1.1	ES6–8013	32	———	D	3	10	Triode No. 1.
5967	1.1	ES3–1086	32	———	D	3	10	Triode No. 2.
5971	1.1	FT2–1000	20	———	B	3	33	
5975	6.3	EV3–1020	29	———	D	3	20	
5977*	6.3	DW1–8053	29	———	D	3	23	F basing.
5987*	6.3	DW1–2050	74	———	B	3	46	F basing.
5992	6.3	HS5–3480	21	———	C	3	44	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
5993	6.3	DX0-9051	0	34	A	7	40	Plate No. 1.
5993	6.3	DX0-1059	0	34	A	7	40	Plate No. 2.
5995	6.3	ET0-1050	0	45	A	7	40	Leads 1-3-4-5.
5998	6.3	HY4-5062	63	———	D	3	40	Triode No. 1.
5998	6.3	HY1-2035	63	———	D	3	40	Triode No. 2.
6000	25.0	HS1-5830	16	———	D	3	34	
6004	5.0	JS0-0000	0	8	A	7	34	Left cap connects to plate.
6004	5.0	JS0-0000	0	8	A	7	35	Right cap connects to plate.
6005	6.3	ET1-5620	21	———	C	3	46	
6007	1.1	DV4-2100	20	0	A	2	15	
6008	0.6	DV4-2100	24	0	A	2	4	
6012	6.3	HS3-5018	(#)	90	A	4	32	
#Should strike between settings 40 and 30 of the BIAS dial.								
6021*	6.3	GT7-8050	20	———	D	3	26	F basing. Triode No. 1.
6021*	6.3	GT2-1040	20	———	D	3	26	F basing. Triode No. 2.
6026*	6.3	EV7-8030	21	———	D	3	30	F basing.
6028	20.0	ET1-5620	10	———	D	3	22	
6029	1.1	CU3-1000	34	———	B	3	50	
6050	1.1	ES3-1000	41	———	B	3	25	
6052*	6.3	DW0-5074	0	57	A	7	40	F basing. Plate No. 1.
6052*	6.3	DW0-1024	0	57	A	7	40	F basing. Plate No. 2.
6055*	25.0	DW1-8050	43	———	B	3	25	F basing.
6072	12.6	EV7-6080	15	———	B	3	32	Triode No. 1.
6072	12.6	EV2-1030	15	———	B	3	32	Triode No. 2.
6080	6.3	HY4-5062	100	———	C	3	36	Triode No. 1.
6080	6.3	HY1-2035	100	———	C	3	36	Triode No. 2.
6082	25.0	HY4-5062	100	———	C	3	43	Triode No. 1.
6082	25.0	HY1-2035	100	———	C	3	43	Triode No. 2.
6084	6.3	EV9-6138	20	———	B	3	33	
6085	12.6	EV7-6080	11	———	C	3	32	Triode No. 1.
6085	12.6	EV2-1030	11	———	C	3	32	Triode No. 2.
6086	20.0	EV2-6139	12	———	D	3	45	
6087	5.0	JS0-6000	0	24	A	7	40	Plate No. 1.
6087	5.0	JS0-4000	0	24	A	7	40	Plate No. 2.
6088	1.1	DV4-1200	20	———	B	(#)	10	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								

DATA TABLE—Continued

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
6094	6.3	DV1-4280	21	———	C	3	46	
6096	6.3	ET1-5620	10	———	D	3	22	
6097	6.3	ET0-7010	0	70	A	2	40	Diode No. 1.
6097	6.3	ET0-2050	0	70	A	2	40	Diode No. 2.
6098	6.3	GY7-3510	34	———	D	3	27	
6099	6.3	ET5-2070	15	———	D	3	23	Triode No. 1.
6099	6.3	ET6-1070	15	———	D	3	23	Triode No. 2.
6100	6.3	ET6-1070	24	———	B	3	55	
6101	6.3	ET5-2076	16	———	D	3	25	Triode No. 1.
6101	6.3	ET6-1075	16	———	D	3	25	Triode No. 2.
6106	5.0	JS0-6000	0	30	A	7	40	Plate No. 1.
6106	6.0	JS0-4000	0	30	A	7	40	Plate No. 2.
6110*	6.3	DW0-5074	0	62	A	2	40	F basing. Diode No. 1.
6110*	6.3	DW0-1024	0	62	A	2	40	F basing. Diode No. 2.
6111*	6.3	DW7-8050	24	———	D	3	25	F basing. Triode No. 1.
6111*	6.3	DW2-1040	24	———	D	3	25	F basing. Triode No. 2.
6112	6.3	DW7-8050	13	———	D	3	13	Triode No. 1.
6112	6.3	DW2-1040	13	———	D	3	13	Triode No. 2.
6113	6.3	HY4-5062	0	———	B	3	32	Triode No. 1.
6113	6.3	HY1-2035	0	———	B	3	32	Triode No. 2.
6134	6.3	HS4-8653	10	———	D	3	30	
6135	6.3	ET6-1070	24	———	B	3	55	
6136	6.3	ET1-5672	16	———	B	3	58	
6137	6.3	HS4-8653	22	———	B	3	48	
6145	6.3	JR6-2374	0	———	D	3	33	
6146	6.3	HS5-0318	30	———	D	3	35	Cap connects to plate.
6147	2.5	HR8-3600	35	———	B	3	40	
6148	6.3	DU7-1265	10	———	D	3	22	
6152	6.3	EV3-1020	29	———	D	3	20	
6159	25.0	HS5-0318	30	———	D	3	35	Cap connects to plate.
6169*	6.3	DW1-2040	12	———	D	3	30	F basing.
6184*	6.3	DW0-2048	0	65	A	2	40	F basing. Diode No. 1.
6184*	6.3	DW0-7058	0	65	A	2	40	F basing. Diode No. 2.
6186	6.3	ET1-5620	10	———	D	3	20	
6188	6.3	HY4-5062	5	———	B	3	80	Triode No. 1.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6188	6.3	HY1-2035	5	------	B	3	30	Triode No. 2.
6189	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
6189	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
6197	6.3	EV2-6317	10	------	D	3	30	
6201	12.6	EV7-6080	10	------	C	3	50	Triode No. 1.
6201	12.6	EV2-1030	10	------	C	3	50	Triode No. 2.
6202	6.3	ET0-6071	0	22	A	7	40	Plate No. 1.
6202	6.3	ET0-1076	0	22	A	7	40	Plate No. 2.
6203	6.3	EV0-9071	0	43	A	7	40	Plate No. 1.
6203	6.3	EV0-1079	0	43	A	7	40	Plate No. 2.
6205	6.3	DW1-5724	22	------	C	3	31	
6206	6.3	DW1-5724	21	------	B	3	50	
6211	12.6	EV7-6082	22	------	D	3	18	Triode No. 1.
6211	12.6	EV2-1037	22	------	D	3	18	Triode No. 2.
6216	6.3	EV2-1730	23	------	D	3	50	
6221	6.3	DW1-8050	32	------	B	3	54	
6222	6.3	DW1-8050	33	0	A	3	16	
6223	6.3	DW1-5780	28	------	B	3	44	
6225	6.3	DW1-5720	27	------	B	3	53	
6227	6.3	EV2-7839	14	------	D	3	35	
6245	6.3	ET7-1265	18	------	D	3	17	
6247*	6.3	DW1-8050	12	------	D	3	16	F basing.
6252	6.3	HS4-8613	13	------	C	3	38	Tetrode No. 1.
			Use adapter E105.					
6252	6.3	HS4-5613	13	------	C	3	38	Tetrode No. 2.
			Use adapter E105.					
6265	6.3	ET1-5627	15	------	B	3	50	
6267	6.3	EV9-6138	28	------	B	3	18	
6286	1.1	CU3-1000	40	------	D	3	9	
6293	6.3	HS5-0310	25	------	D	3	36	
6320	12.6	EV1-6720	44	------	C	3	40	Tetrode No. 2.#

#Connect the negative (−) end of a 30-volt battery to pin No. 3 of the loktal test socket. Connect the positive (+) end of the 30-volt battery to pin No. 2 of the loktal test socket.

Caution: **Disconnect battery before changing selector switch positions.**

6350	12.6	EV8-6073	25	------	D	3	23	Triode No. 1.
6350	12.6	EV3-1028	25	------	D	3	23	Triode No. 2.
6355	6.3	FT1-4270	0	100	A	3	------	Eye 1 open. Eye 2 closed.
6355	6.3	FT4-1270	0	100	A	3	------	Eye 2 open. Eye 1 closed.
6360	12.6	EV3-8720	44	------	C	3	40	Tetrode No. 1.#

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
#Connect the negative (−) end of a 30-volt battery to pin No. 1 of the loktal test socket. Connect the positive (+) end of the 30-volt battery to pin No. 2 of the loktal test socket.								
Caution: **Disconnect battery before changing selector switch positions.**								
6374	6.3	EV0-0030	0	32	A	7	60	Cap connects to plate.
6385	6.3	KR7-6080	17	------	D	3	23	Triode No. 1.
6385	6.3	KR3-4020	17	------	D	3	23	Triode No. 2.
6386	6.3	KR7-6085	22	------	D	3	20	Triode No. 1.
6386	6.3	KR3-4025	22	------	D	3	20	Triode No. 2.
6397	2.5	HR8-3600	33	------	B	3	48	
6414	12.6	EV7-6080	29	------	B	3	44	Triode No. 1.
6414	12.6	EV2-1030	29	------	B	3	44	Triode No. 2.
6417	12.6	EV9-1673	8	------	D	3	35	
6418	1.5	DV0-2041	0	0	A	2	6	Make no gas test.
6463	12.6	EV8-6071	24	------	D	3	26	Triode No. 1.
6463	12.6	EV3-1026	24	------	D	3	26	Triode No. 2.
6485	6.3	ET1-5672	10	------	D	3	30	
6519	1.5	DV4-1200	0	0	A	4	21	Make no gas test.
6524	6.3	FT6-0140	22	------	C	3	56	Cap above octal pins 2 and 3 connects to plate.
6550	6.3	HS5-3481	23		D	3	48	
#Connect the negative (−) end of a 30-volt battery to pin No. 2 of the loktal test socket. Connect the positive (+) end of the 30-volt battery to pin No. 4 of the loktal test socket.								
Caution: **Disconnect battery before changing selector switch positions.**								
6611	1.5	DV0-2041	0	0	A	2	10	
6612	1.5	DV0-2041	0	0	A	2	25	Make no gas test.
6636	6.3	EV2-7839	10	------	D	3	48	Make no gas test.
6660	6.3	ET1-5672	9	------	C	3	41	
6661	6.3	ET1-5627	15	------	B	3	50	
6662	6.3	ET1-5627	0	------	C	3	48	
6663	6.3	ET0-7010	0	70	A	2	40	Diode No. 1.
6663	6.3	ET0-2050	0	70	A	2	40	Diode No. 2.
6669	6.3	ET1-5620	21	------	C	3	46	
6677	6.3	EV2-6317	10	------	D	3	30	
6678	6.3	EV2-6370	15	------	B	3	57	Pentode sect.
6678	6.3	EV9-1080	16	------	C	3	57	Triode sect.
6679	12.6	EV7-6080	10	------	C	3	50	Triode No. 1.
6679	12.6	EV2-1030	10	------	C	3	50	Triode No. 2.
6680	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
6680	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
6681	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
6681	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
6688	6.3	EV2-7918	10	------	D	3	50	
6689	6.3	EV2-6139	13	------	D	3	35	

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
6690	6.3	DW7-5080	22	------	C	3	31	Triode No. 1.
6690	6.3	DW2-1040	22	------	C	3	31	Triode No. 2.
6754	6.3	EV0-9700	0	59	A	7	40	Plate No. 1.
6754	6.3	EV0-1030	0	59	A	7	40	Plate No. 2.
6761	6.3	EV2-1730	44	------	D	3	38	
6788	6.3	DW1-5720	27	------	B	3	12	
6814	6.3	DW1-8050	33	------	C	3	32	
6829	12.6	EV7-6080	13	------	D	3	34	Triode No. 1.
6829	12.6	EV2-1030	13	------	D	3	34	Triode No. 2.
6832	6.3	DW7-8050	34	------	B	3	16	Triode No. 1.
6832	6.3	DW2-1040	34	------	B	3	16	Triode No. 2.
6877	6.3	DV1-4080	65	------	D	3	24	
6883	12.6	HS5-0318	30	------	D	3	35	Cap connects to plate.
6887	6.3	ET0-7010	0	54	A	2	40	Diode No. 1.
6887	6.3	ET0-2050	0	54	A	2	40	Diode No. 2.
6888	6.3	HS4-8653	23	------	B	3	60	
6907	6.3	HS4-8613	13	------	C	3	38	Tetrode No. 1.#
6907	6.3	HS4-5613	13	------	C	3	38	Tetrode No. 2.#
#Use adapter E105.								
6919	6.3	ET0-7016	0	70	A	2	40	Diode No. 1.
6919	6.3	ET0-2056	0	70	A	2	40	Diode No. 2.
6922	6.3	EV2-1030	21	------	D	3	50	Triode No. 1.
6922	6.3	EV7-6080	21	------	D	3	50	Triode No. 2.
6939	12.6	EV3-8720	20	------	C	3	65	Tetrode No. 1.

Connect negative (−) end of 30-volt battery to pin No. 3 of octal socket. Connect positive (+) end of 30-volt battery (Eveready No. 413) to pin No. 2 of octal socket for each test.

Caution: **Disconnect battery between selector changes.**

6939	12.6	EV1-6720	20	------	C	3	65	Tetrode No. 2.
6943	6.3	DW1-5724	22	------	B	3	51	
6944	6.3	DW1-5724	22	------	B	3	51	
6945	6.3	DW1-5720	45	------	C	3	41	
6946	6.3	DW1-8050	32	------	C	3	37	
6947	6.3	DW7-8050	30	------	B	3	33	Triode No. 1.
6947	6.3	DW2-1040	30	------	B	3	33	Triode No. 2.
6948	6.3	DW7-8050	29	------	B	3	23	Triode No. 1.
6948	6.3	DW2-1040	29	------	B	3	23	Triode No. 2.
6954	6.3	ET1-5627	14	------	B	3	50	
6973	6.3	EV3-9170	18	------	D	3	24	
7000	6.3	HS0-3485	22	------	B	3	31	Cap connects to grid No. 1.
7025	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
7025	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
7027	6.3	HS5-3180	23	------	D	3	25	
7036	6.3	ET7-5621	20	------	B	3	30	Amplifier sect.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
7036	6.3	ET1-5627	10	------	B	3	38	Oscillator sect.
7044	12.6	EV7-9060	18	------	D	3	50	Triode No. 1.
7044	12.6	EV2-1030	18	------	D	3	50	Triode No. 2.
7054	12.6	EV2-7813	9	------	D	3	46	
7055	12.6	ET0-7010	0	70	A	2	40	Diode No. 1.
7055	12.6	ET0-2050	0	70	A	2	40	Diode No. 2.
7056	12.6	ET1-5627	11	------	D	3	28	
7057	12.6	EV7-6089	17	------	D	3	34	Triode No. 1.
7057	12.6	EV2-1039	17	------	D	3	34	Triode No. 2.
7058	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
7058	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
7059	12.6	EV2-6370	18	------	C	3	31	Pentode sect.
7059	12.6	EV9-1080	12	------	D	3	43	Triode sect.
7060	12.6	EV8-6790	14	------	D	3	50	Pentode sect.
7060	12.6	EV2-1030	27	------	B	3	50	Triode sect.
7061	12.6	EV3-9170	21	------	C	3	46	
7119	12.6	EV7-9060	20	------	E	3	40	Triode No. 1.
7119	12.6	EV2-1030	20	------	E	3	40	Triode No. 2.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
7189	6.3	EV2-7930	10	------	D	3	46	
7193	6.3	HS0-0080	13	------	C	3	38	Upper cap connects to grid. Lower cap connects to plate.
7199	6.3	EV7-2360	12	------	C	3	50	Pentode sect.
7199	6.3	EV9-1080	29	------	C	3	42	Triode sect.
7247	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
7247	12.6	EV2-1030	24	------	B	3	55	Triode No. 2.
7258	12.6	EV8-6791	10	------	C	3	56	Pentode sect.
7258	12.6	EV2-1736	20	------	C	3	56	Triode sect.
7316	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
7316	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
7355	6.3	HS6-3850	20	------	D	3	34	
7360	6.3	EV3-6219	27	------	B	3	24	Connect pin 1 to pin 8 and pin 6 to pin 7 on loctal socket.
7370	20.0	FY7-9060	23	------	D	3	38	Triode No. 1.
7370	20.0	JU2-1030	23	------	D	3	38	Triode No. 2.
7408	6.3	HS5-3481	21	------	C	3	46	
7543	6.3	ET1-5672	16	------	B	3	58	
7551	12.6	EV2-6317	26	------	D	3	30	
7558	6.3	EV2-6317	26	------	D	3	30	
7581	6.3	HS5-3480	20	------	D	3	51	
7586	6.3	DR4-2080	27	------	D	3	40	Use Hickok adapter Code No. 1050-127

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
7587	6.3	DR4-0280	10	------	D	(#)	38	Cap connects to plate. Use Hickok adapter Code No. 1050-127.
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
7591	6.3	HS6-3450	10	------	D	3	36	
7687	6.3	EV2-6370	15	------	C	3	35	Pentode sect.
7687	6.3	EV9-1080	35	------	C	3	22	Triode sect.
7693	6.3	ET1-5627	15	------	B	3	50	
7694	6.3	ET1-5627	0	------	C	3	48	
7695	50.0	EV6-1170	30	------	D	3	48	
7700	6.3	GR0-2354	21	------	B	3	31	Cap connects to grid.
7701	12.6	EV2-0910	11	------	C	3	48	
7716	12.6	EV7-9860	10	------	D	3	30	Pentode sect.
7716	12.6	EV2-3010	26	------	B	3	24	Triode sect.
7719	12.6	EV2-1030	38	------	C	3	14	
7724	12.6	EV8-9070	20	------	B	3	12	Triode sect.
7724	12.6	EV0-2030	0	0	A	2	32	Diode No. 1.
7724	12.6	EV0-6010	0	0	A	2	32	Diode No. 2.
7728	12.6	EV7-6080	10	------	C	3	50	Triode No. 1.
7728	12.6	EV2-1030	10	------	C	3	50	Triode No. 2.
7729	12.6	EV7-6080	12	------	B	3	32	Triode No. 1.
7729	12.6	EV2-1030	12	------	B	3	32	Triode No. 2.
7730	12.6	EV7-6080	24	------	B	3	56	Triode No. 1.
7730	12.6	EV2-1030	24	------	B	3	56	Triode No. 2.
7731	6.3	EV2-6370	15	------	B	3	57	Pentode sect.
7731	6.3	EV9-1080	16	------	C	3	57	Triode sect.
7732	6.3	ET1-5627	11	------	D	3	28	
7733	12.6	EV2-7813	9	------	D	3	46	
7754	6.3	EV6-9170	30	------	D	3	48	
7759	25.0	DW7-8050	25	------	C	3	31	Triode No. 1.
7759	25.0	DW2-1040	25	------	C	3	31	Triode No. 2.
7760	25.0	DW7-8050	43	------	B	3	25	Triode No. 1
7760	25.0	DW2-1040	43	------	B	3	25	Triode No. 2.
7761	25.0	DW1-5720	25	------	D	3	21	
7762	25.0	DW1-5720	43	------	C	3	53	
7788/E810F	6.3	EV2-7938	29	------	C	3	50	
7854	12.6	HR6-0340	35	------	C	3	60	Plate No. 1.#

#Use Hickok adapter Code No. 1050-107. Connect the negative end of a 30-volt battery to pin 2 of the large 7-pin socket; connect the positive end of the battery to pin 4 of the large 7-pin socket. Connect the plate jack connector to the cap pin over pin 6 of the octal socket.

7854	12.6	HR2-0340	35	------	C	3	60	Plate No. 2.#

#Connect the negative end of a 30-volt battery to pin 6 of the large 7-pin socket. Connect the positive end of the battery to pin 4 of the large 7-pin socket. Connect the plate jack connector to the cap pin over pin 3 of the octal socket.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
Caution: **Disconnect the battery (Eveready No. 413) before changing selector settings.**								
7895	6.3	DR4-2080	17	------	D	3	32	Use Hickok adapter Code No. 1050-127.
17GW6	20.0	HS5-0480	31	------	D	(1)	38	Cap connects to plate. Make LINE TEST at 56.
8005	10.0	ER3-0000	22	------	B	3	50	Cap connects to plate.
8013A	3.0	ER0-0000	0	75	A	4	40	Cap connects to plate.
8016	1.1	HS0-0000	0	68	A	4	50	Cap connects to plate.
8020	5.0	ER0-0000	0	85	A	4	40	Cap connects to plate.
8032	12.6	HS5-0318	30	------	D	3	35	Cap connects to plate.
8077	12.6	EV2-7813	9	------	D	3	46	
9001	6.3	ET1-5670	21	------	B	3	28	
9002	6.3	ET6-1070	22	------	B	3	48	
9003	6.3	ET1-5620	17	------	B	3	38	
9004	6.3	GR0-3040	0	65	A	2	40	Diode.
9005	4.3	GR0-4030	0	52	A	2	40	Diode.
9006	6.3	ET0-1070	0	52	A	2	40	Diode.
38142	7.5	ER3-2000	37	------	B	3	55	
XXB	2.5	BY5-6000	10	------	B	3	28	Triode No. 1.
XXB	2.5	JR4-3000	10	------	B	3	28	Triode No. 2.
XXD	12.6	JR4-6070	21	------	C	3	33	Triode No. 1.
XXD	12.6	JR4-3020	21	------	C	3	33	Triode No. 2.

Disregard shorts test after GM test is completed. Allow 60 seconds for heater warmup. Allow 5 seconds to obtain GM reading.

[1] Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.

DATA TABLE—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
XXFM	6.3	JR3–2040	0	———	B	3	23	Triode sect.
XXFM	6.3	JR0–5040	0	67	A	2	40	Diode No. 1.
XXFM	6.3	JR0–6070	0	67	A	2	40	Diode No. 2.
XXL	6.3	JR6–2070	23	———	B	3	50	
4B31	Requires special socket.							
5C22	Requires special socket.							
371B	Requires special socket.							

3. **Conversion Table.** The table below lists Army VT numbers of tubes and their commercial numbers.

VT No.	*Coml No.*
VT–1	WE–203A (obsolete)
VT–2	WE–205B
VT–3	Obsolete
VT–4A	Obsolete
VT–4B	Coml 211
VT–4C	JAN 211
VT–5	WE–215A
VT–6	212A (obsolete)
VT–7	WX–12 (obsolete)
VT–8	UV–204 (obsolete)
VT–10	Obsolete
VT–11	Obsolete
VT–12	Obsolete
VT–13	Obsolete
VT–14	Obsolete
VT–16	Obsolete
VT–17	860
VT–18	Obsolete
VT–19	861
VT–20	Obsolete
VT–21	Obsolete
VT–22	204A
VT–23	Obsolete
VT–24	864
VT–25	10
VT–25A	10 Special
VT–26	22
VT–27	30
VT–28	24, 24A
VT–29	27
VT–30	01–A
VT–31	31
VT–32	Obsolete
VT–33	33
VT–34	207
VT–35	35/51
VT–36	36
VT–37	37
VT–38	38
VT–39	869
VT–39A	869A
VT–40	40
VT–41	851
VT–42	872
VT–42A	872A (special fil)
VT–43	845
VT–44	32
VT–45	45
VT–46	866
VT–46A	866A
VT–47	47
VT–48	41
VT–49	39/44
VT–50	50
VT–51	841
VT–52	45 special
VT–53	Canceled (superseded by VT–42A)
VT–54	34
VT–55	865

VT No.	Coml No.
-56	56
-57	57
-58	58
-60	850
-62	801, 801A
-63	46
-64	800
'-65	6C5
'-65A	6C5G
'-66	6F6
'-66A	6F6G
'-67	30 specia'
'-68	6B7
'-69	6D6
'-70	6F7
'-72	842
'-73	843
'-74	5Z4
'-75	75
'-76	76
'-77	77
'-78	78
T-80	80
T-83	83
T-84	84/6Z4
T-86	6K7
'T-86A	6K7G
'T-86B	6K7GT
'T-87	6L7
'T-87A	6L7G
/T-88	6R7
/T-88A	6R7G
/T-88B	6R7GT
/T-89	89
/T-90	6H6
/T-90A	6H6GT
VT-91	6J7
VT-91A	6J7GT
VT-92	6Q7
VT-92A *	6Q7G
VT-93	6B8
VT-93A	6B8G
VT-94	6J5
VT-94A	6J5G
VT-94B	6J5 special selection
VT-94C	6J5G special selection
VT-94D	6J5GT
VT-95	2A3
VT-96	6N7
VT-96B	6N7 special selection
VT-97	5W4
VT-98	6U5/6G5
VT-99	6F8G
VT-100	807
VT-100A	807 modified
VT-101	837
VT-102	Canceled
VT-103	6SQ7
VT-104	12SQ7
VT-105	6SC7
VT-106	803
VT-107	6V6
VT-107A	6V6GT
VT-107B	6V6G
VT-108	450TH
VT-109	2051
VT-111	5BP4/-1802P4
VT-112	6AC7/-1852
VT-114	5T4
VT-115	6L6
VT-115A	6L6G
VT-116	6SJ7
VT-116A	6SJ7GT
VT-116B	6SJ7Y
VT-117	6SK7
VT-117A	6SK7GT
VT-118	832
VT-119	2X2/879
VT-120	954
VT-121	955
VT-122	530
VT-123	RCA A-5586 (superseded by VT-128)
VT-124	1A5GT
VT-125	1C5GT
VT-126	6X5

See footnote on page 78.

VT No.	Coml No.
VT-126A	6X5G
VT-126B	6X5GT
VT-127	Special tube
VT-127A	Special tube
VT-128	1630 (A-5588)
VT-129	304TL
VT-130	250TL
VT-131	12SK7
VT-132	12K8 special
VT-133	12SR7
VT-134	12A6
VT-135	12J5GT
VT-135A	12J5
VT-136	1625
VT-137	1626
VT-138	1629
VT-139	VR150-30
VT-140 *	1628
VT-141	531
VT-142	WE-39DY1
VT-143	805
VT-144	813
VT-145	5Z3
VT-146	1N5GT
VT-147	1A7GT
VT-148	1D8GT
VT-149	3A8GT
VT-150	6SA7
VT-150A	6SA7GT
VT-151	6A8G
VT-151B	6A8GT
VT-152	6K6GT
VT-152A	6K6G
VT-153	12C8 special
VT-154	814
VT-155	Special tube
VT-156	Special tube
VT-157	Special tube
VT-158	Special tube
VT-159	Special tube
VT-160	Special tube
VT-161	12SA7
VT-162	12SJ7
VT-163	6C8G
VT-164	1619
VT-165	1624
VT-166	371A
VT-167	6K8
VT-167A	6K8G
VT-168A	6Y6G
VT-169	12C8
VT-170	1E5-GP
VT-171	1R5
VT-171A	Local equivalent of 1R5
VT-172	155
VT-173	1T4
VT-174	3S4
VT-175	1613
VT-176	6AB7/-1853
VT-177	1LH4
VT-178	1LC6
VT-179	1LN5
VT-180 *	3LF4
VT-181	7Z4
VT-182	3B7/1291
VT-183	1R4/1294
VT-184	VR90-30
VT-185	3D6/1299
VT-186	Special tube
VT-187	575A
VT-188	7E6
VT-189	7F7
VT-190	7H7
VT-191	316A
VT-192	7A4
VT-193	7C7
VT-194	7J7
VT-195	1005
VT-196	6W5G
VT-197A	5Y3GT/G
VT-198A	6G6G
VT-199	6SS7
VT-200	VR-105-30
VT-201	25L6
VT-201C	25L6GT
VT-202	9002

See footnote on page 78.

VT No.	Coml No.
VT-203	9003
VT-204	HK24G
VT-205	6ST7
VT-206A	5V4G
VT-207	12AH7GT
VT-208	7B8
VT-209	12SG7
VT-210	1S4
VT-211	6SG7
VT-212	958
VT-213A	6L5G
VT-214	12H6
VT-215	6E5
VT-216	816
VT-217	811
VT-218	100TH
VT-219	Canceled
VT-220	250TH
VT-221	3Q5GT
VT-222	884
VT-223	1H5GT
VT-224	RK34
VT-225	307A
VT-226	2EP/1806P1
VT-227	7184
VT-228	8012
VT-229	6SL7GT
VT-230	350A
VT-231	6SN7GT
VT-232	E-1148
VT-233	6SR7
VT-234	HY-114B
VT-235	HY-615
VT-236	836
VT-237	957
VT-238	956
VT-239	1LE3
VT-240	710A
VT-241	7E5/1201
VT-243	7C4/-1203A
VT-244	5U4G
VT-245	2050
VT-246	918
VT-247	6AG7
VT-248	1808P1
VT-249	1006
VT-250	EF50
VT-251	441
VT-252	923
VT-254	304TH
VT-255	705A
VT-256	ZP486
VT-257	K-7
VT-259	829
VT-260	VR75-30
VT-264	3Q4
VT-266	1616
VT-267	578
VT-268	12SC7
VT-269	717A
VT-277	417
VT-279	GY-2
VT-280 *	C7063
VT-281 *	HY-145ZT
VT-282	ZG489
VT-283 *	QF-206
VT-284 *	QF-197
VT-285 *	QF-200C
VT-286	832A
VT-287	815
VT-288	12SH7
VT-289	12SL7GT

* Indicates VT number has been canceled.

4. **Data Table for CV Type Tubes.** Where a crosshatch sign (#) appears in the test data, read the notation carefully before the tube is tested.

DATA TABLE FOR CV TYPE TUBES

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
CV51	6.3	CX8-4050	0	100	A	3	____	Eye open.
CV51	6.3	CX8-4350	0	100	A	3	____	Eye closed.

DATA TABLE FOR CV TYPE TUBES—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
CV54	4.3	DU0–0000	———	30	A	7	40	Cap connects to plate.
CV65	2.0	BY5–3400	22	———	C	3	35	
CV73	4.3	FU2–0760	40	———	C	3	50	
CV131	6.3	DU1–5726	17	———	B	3	40	
CV132	———	———	———	———	———	———	———	
CV136	6.3	DU1–5720	23	———	C	3	45	
CV137	6.3	DU6–7050	16	———	B	3	60	Triode sect.
CV137	6.3	DU0–1020	———	75	A	2	40	Diode sect.
CV138	6.3	DU1–5726	11	———	C	3	50	
CV140	6.3	ET0–2050	———	70	A	2	40	Diode No. 1.
CV140	6.3	ET0–7010	———	70	A	2	40	Diode No. 2.
CV173	6.3	BV7–3264	17	———	D	3	40	
CV181	6.3	HY1–2030	16	———	B	3	65	Triode No. 1.
CV181	6.3	HY4–5060	16	———	B	3	65	Triode No. 2.
CV287	OFF	AP0–4020	———	55	A	4	40	
CV309	6.3	BV7–2464	44	———	B	3	60	
CV329	6.3	ET1–5726	14	———	B	3	29	
CV345	6.3	CX5–0480	42	———	D	3	30	Cap connects to plate.
CV378	5.0	CY0–4000	———	70	A	7	40	Plate No. 1.
CV378	5.0	CY0–6000	———	70	A	7	40	Plate No. 2.
CV391	———	———	———	———	———	———	———	
CV399	4.3	DU2–1050	16	———	C	3	30	
CV428	6.3	BY6–0320	30	———	C	3	30	Use Stark EC adapter.[a] Cap connects to plate.
CV431	OFF	AP0–2040	———	80	A	4	40	
CV465	6.3	DW1–5724	17	———	D	3	22	Use flying lead adapter E104.
CV466	6.3	DW1–4572	22	———	D	3	21	Use flying lead adapter E104.
CV468	6.3	CT1–8070	28	———	D	3	28	Use flying lead adapter E104.
CV469	6.3	MU–0–2030	———	68	A	2	40	Use flying lead adapter E104.
CV473	6.3	DW0–2050	———	40	A	7	40	Use flying lead adapter E104.
CV475	6.3	DW1–5728	17	———	C	3	26	Use flying lead adapter E104.
CV523	12.6	DU0–1050	———	40	A	2	40	Diode No. 1.
CV523	12.6	DU0–2050	———	40	A	2	40	Diode No. 2.
CV569		Test as 6S17.						
CV826	4.3	EV0–7360	13	———	B	3	80	Cap connects to grid.

DATA TABLE FOR CV TYPE TUBES—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
CV826	4.3	EV2-1060	13	———	B	3	35	
CV1037	4.3	DU2-1050	16	———	C	3	30	
CV1039	4.3	DU0-1000	———	60	A	7	40	Plate No. 1.
CV1039	4.3	DU0-2000	———	60	A	7	40	Plate No. 2.
CV1040	4.3	ET2-1000	18	———	D	3	30	
CV1052	6.3	HS0-3480	22	———	C	3	50	Cap connects to grid No. 1.
CV1053	6.3	CX0-3485	30	———	B	3	40	Cap connects to grid No. 1.
CV1054	6.3	CX0-5080	———	24	A	2	40	Diode No. 1.
CV1054	6.3	CX0-3040	———	24	A	2	40	Diode No. 2.
CV1055	6.3	CX0-3080	21	———	B	3	50	Triode sect. Cap connects to grid No. 1.
CV1055	6.3	CX0-4080	———	14	A	2	40	Diode No. 1.
CV1055	6.3	CX0-5080	———	14	A	2	40	Diode No. 2.
CV1056	6.3	CX5-3485	19	———	B	3	38	
CV1064	4.3	DU0-2000	———	40	A	7	40	Plate No. 1.
CV1064	4.3	DU0-3000	———	40	A	7	40	Plate No. 2.
CV1065	6.3	BY0-3425	10	———	D	3	35	Cap connects to grid No. 1.
CV1067	6.3	CX5-3080	22	———	C	3	40	
CV1071		Test as 5U4G.						
CV1072	4.3	ET-0-0000	———	55	A	7	40	Use adapter for British types.
CV1073		Test as 6F5.						
CV1075	6.3	CX5-3480	12	———	D	3	40	
CV1078	4.3	BT0-8020	———	60	A	7	40	Use Stark ED adapter.[a] Place lead to top pin. Cap connects to plate.
CV1083	2.0	EV2-0713	0	———	B	(#)	20	
#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT. COND.								
CV1091	6.3	BV7-3268	8	———	C	3	40	
CV1092	6.3	BT0-8020	———	60	A	7	40	Use Stark ED adapter. Place lead to top pin.
CV1099	6.3	Test as 6K8.						
CV1100	6.3	CX0-3480	25	———	C	3	45	Cap connects to grid No. 1.
CV1101	6.3	HS-0-3080	22	———	D	3	16	Top cap connects to grid. Triode sect.

DATA TABLE FOR CV TYPE TUBES—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
CV1101	6.3	HS-0-4080	.....	15	A	2	40	Diode No. 1.
CV1101	6.3	HS-0-5080	.....	40	A	2	40	Diode No. 2.
CV1102	6.3	HS-5-6080	37	.....	C	3	40	Triode No. 1.
CV1102	6.3	HS-0-3040	37	.....	C	3	40	Top cap connects to grid. Triode No. 2.
CV1103	6.3	CX8-4050	0	100	A	3	.....	Eye open.
CV1103	6.3	CX8-4350	0	100	A	3	.....	Eye closed.
CV1111	4.3	DU0-0000	.....	10	A	7	20	Cap connects to plate.
CV1113	4.3	DU0-0000	.....	0	A	7	40	Cap connects to plate.
CV1122	4.3	DU2-1050	16	.....	D	3	35	
CV1136	6.3	BV6-2385	15	.....	C	3	40	
CV1137 .	6.3	BV2-4030	14	.....	C	3	55	
CV1164 ..	4.3	DU2-0155	18	.....	B	3	62	Cap connects to plate.
CV1169 ..	4.3	EV2-0763	20	.....	B	3	45	Cap connects to plate.
CV1170	4.3	DU0-1050	.....	35	A	2	40	
CV1171 ...	4.3	British Acorn 5-pin	0	.....	C	3	30	
CV1173 ..	4.3	DU2-1050	11	.....	C	3	30	
CV1193 ..	6.3	Test as 6K8.						
CV1197 ..	6.3	Special Base BT5-8020	13	.....	C	3	40	Use Stark ED adapter.[a] Place leads to top pins.
CV1198 ..	4.3	DU2-0050	16	.....	D	3	35	Cap connects to plate.
CV1264	4.3	DU0-1000	.....	60	A	7	40	
CV1285	6.3	Test as 6N7.	.....	.....	.....	.....	.....	
CV1290 ..	2.0	DU0-0000	....	82	A	4	40	Cap connects to plate.
CV1300	12.6	DU0-1050	.....	40	A	2	40	Diode No. 1.
CV1300	12.6	DU0-2050	.....	40	A	2	40	Diode No. 2.
CV1306	2.0	BY0-3000	21	.....	B	3	30	Cap connects to grid.
CV1306	2.0	BY0-7000	.....	20	A	2	40	Diode No. 1.
CV1306	2.0	BY0-5000	.....	20	A	2	40	Diode No. 2.
CV1321	12.6	EV0-2763	19	.....	B	3	35	Cap connects to grid.
CV1326	4.3	EV2-7360	23	.....	D	3	35	
CV1331	2.0	BY0-3405	25	.....	B	3	15	Top cap connects to grid.
CV1347	6.3	Test as 6K8	.....	.....	.....	.....	.....	
CV1456 . .	35.0	BY5-3426	0	.....	D	3	25	
CV1457	12.6	BY0-3425	12	.....	C	3	40	Cap connects to grid.

DATA TABLE FOR CV TYPE TUBES—Continued

Tube type	*Filament*	*Selectors*	*Bias*	*Shunt*	*Range*	*Press*	*Minimum value*	*Notations*
CV1510	6.3	BY7-2368	39		C		40	
CV1574	4.3	JR0-3452	12		D	3	25	Top cap connects to grid.
CV1581	6.3	HS5-3486	16		C	3	18	Hexode sect. Top cap connects to grid.
CV1581	6.3	HS5-6483	26		C	3	16	Triode sect.
CV1865	6.3	FU1-8030	22		C	3	42	
CV1989	6.3	ET0-2050		70	A	2	40	
CV2128	6.3	FU2-6137	11		C	3	25	Hexode sect.
CV2128	6.3	FU9-8030	21		C		86	Triode sect.
CV2135	6.3	FU2-7839	24	0	B	3	28	
CV2220	12.6	EY5-2360	33		C	3	48	
CV2243	6.3	EV2-7839	19		D	3	30	
CV4040	6.3	ET1-5720	32	0	C	3	42	
CV4061	1.5	ER0-0000	0	51	A	4	40	
CV4062	6.3	ET1-5722	32	0	D	3	28	
ECC34	6.3	JX1-2030	35		C	3	35	Triode No. 1.
ECC34	6.3	JX4-5060	35		C	3	35	Triode No. 2.

* Available through British and Canadian supply channels.

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44-536	55-16	55-126
44-537	55-27	55-127
44-544	55-28	55-128
44-545	55-38	55-129
44-546	55-46	55-157
44-547	55-47	55-500 (AA-AE)
44-548	55-57	
44-500 (AA-AC)	55-75	

NG: State AG (6) units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

☆U.S. GOVERNMENT PRINTING OFFICE: 1977—249-863

SUPPLEMENT
TECHNICAL MANUAL
TEST DATA FOR ELECTRON TUBE TEST SETS TV-7( )/U - 15 December 1986

1. LIST OF AFFECTED PAGES IN BASIC MANUAL: 70

2. SUPPLEMENTAL INFORMATION: Page 70, DATA TABLE, after Tube Type 6293 add the following:

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
6336	6.3	HY4-5062	100		C	3	36	Triode No.1
6336	6.3	HY1-2035	100		C	3	36	Triode No.2

Changes to the Technical Manuals

- **T.O. 33AA21-5-32S-1, 20 September 1973**: This Publication supplements T.O. 33AA21-5-32 dated 30 June 1960

OPERATIONAL SUPPLEMENT
TECHNICAL MANUAL
FIELD AND DEPOT MAINTENANCE MANUAL
TEST SETS, ELECTRON TUBE TV-7( )/U - 20 September 1973

Page 48A, Chart under paragraph 36, Step 2, second column 'Equipment under test control settings' is ammended as follows:
No change from end of Step 1, except:
Selector switches:
Grid: 5
Plate: 3
Screen: 4
Cathode: 6
Suppressor: 0
Function switch: A

- **T.O. 33AA21-5-32S-2, 25 January 1978**: This Publication supplements T.O. 33AA21-5-32 dated 30 June 1960

OPERATIONAL SUPPLEMENT
TECHNICAL MANUAL
FIELD AND DEPOT MAINTENANCE MANUAL
TEST SETS, ELECTRON TUBE TV-7( )/U - 25 January 1978

Add the following statement to the basic technical manual:
All connector plugs (P101) and power cords will be wired in accordance with T.O. 33-1-32

2G21	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2G22	1.1	EX3-2651	53	0	A	4	20	Heptode sect.
2G22	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2GK5	2.5	ET2-5076	30		C	3	38	
2T4	2.5	ET2-1050	37		D	3	25	
2V2	2.5	HS0-0050	0	45	A	4	40	Cap connects to plate. Short on 3
2V3	2.5	HS0-0000	0	68	A	4	40	Cap connects to plate
2W3	2.5	JS0-4000	0	0	A	7	40	
2X2A	2.5	ER0-0000	0	78	A	4	40	Cap connects to plate. Short on 3
2Z2	2.5	ER0-2000	0	0	A	7	34	

TABLE UNDER CONSTRUCTION!. Keep tuned for upgrades.

- **T.O. 33AA21-5-31C, 15 January 1965**: This Technical Order supplements T.O. 33AA21-5-31 dated 17 January 1962

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U - 15 January 1965

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
6293	6.3	HS5-0310	25		D	3	36	
6540	6.3	DU7-1265	10		D	3	22	
6850	12.6	FT6-0140	22		C	3	56	Cap above octal pins 2 and 3 connects to plate. Use Hickok adapter 1050-107. Connect negative end of a 30 V battery to pin 2 of the Loctal socket. Connect positive end of the 30 V battery to pin 4 of the Loctal socket
		FT2-						Cap above octal pins 6 and 7 connects to plate. Connect negative end of a 30 V battery to pin 6 of the Loctal socket. Connect positive end of

6850	12.6	0140	22	C	3	56	the 30 V battery to pin 4 of the Loctal socket. *** CAUTION *** Disconnect battery between selector changes
6872	6.3	DU7-1265	27	B	3	45	
7308	6.3	EV7-6080	21	D	3	50	Triode No.1
7308	6.3	EV2-1030	21	D	3	50	Triode No.2
7868	6.3	EV2-9730	10	D	3	42	Use Hickok adapter 1050-144
7889	25.0	DW7-8050	13	D	3	13	Triode No.1
7889	25.0	DW2-1040	13	D	3	13	Triode No.2

- **T.O. 33AA21-5-31E, 1 December 1965**: This Technical Order supplements T.O. 33AA21-5-31 dated 17 January 1962

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7D/U - 1 December 1965

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
5AR4	5.0	JS0-6000	0	70	A	7	40	Plate No.1
5AR4	5.0	JS0-4000	0	70	A	7	40	Plate No.2
6AR11	6.3	BS4-8937	12		C	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
6AR11	6.3	BX5-2364	12		C	3	51	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
6AU4	6.3	HY0-5030	0	66	A	7	40	
6B10	6.3	BV3-4020	29		C	3	28	Triode No.1 (use Hickok adapter 1704, selectors 0-0-5)
6B10	6.3	BS5-6070	29		C	3	28	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No.2 (use Hickok adapter 1704, selectors 8-0-2)
6BD11	6.3	BT5-2490	27		C	3	38	Pentode section (use Hickok adapter 1704, selectors 4-5-3)

6BD11	6.3	BS6-8050	29		B	3	38	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6BD11	6.3	BS3-4070	24		B	3	54	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6BF11	6.3	BS8-3490	31		D	3	33	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
6BF11	6.3	BY3-7625	26		B	3	10	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-8)
6DQ6B	6.3	HS5-0480	36		D	3	30	Cap connects to plate
12BY7A	12.6	EV2-7813	9		D	3	46	
866	3.0	ER0-0000	0	67	A	7	40	Cap connects to plate
6883	12.6	HS5-0318	30		D	3	35	Cap connects to plate
7587	6.3	DR4-0280	10		D	#	38	Cap connects to plate. Use Hickok adapter 1050-127. # Hold down push button 2-DIODE and press push button 3-MUT.COND.
7788/E810F	6.3	EV2-7938	29		C	3	50	
7854	12.6	HR6-0340	35		C	3	60	Plate No.1 : Use Hickok adapter 1050-107. Connect the negative end of a 30 V battery to pin 2 of the large 7 pin socket. Connect the positive end of the battery to pin 4 of the large 7 pin socket. Connect the plate jack connector to the cap pin over pin 6 of the octal socket. CAUTION: disconnect the battery before changing selector settings.
7854	12.6	HR2-0340	35		C	3	60	Plate No.2 : Use Hickok adapter 1050-107. Connect the negative end of a 30 V battery to pin 6 of the large 7 pin socket. Connect the positive end of the battery to pin 4 of the large 7 pin socket. Connect the plate jack connector to the cap pin over pin 3 of the octal socket. CAUTION: disconnect the battery before changing selector settings.
7895	6.3	DR4-2080	17		D	3	32	Use Hickok adapter 1050-127
8032	12.6	HS5-0318	30		D	3	35	Cap connects to plate
8077	12.6	EV2-7813	9		D	3	46	

- **T.O. 33AA21-5-31P, 1 March 1975**: This publication supplements TO 33AA21-5-31, dated 17 January 1962, and replaces TO 33AA21-5-31M, dated 1 May 1973 and TO 33AA21-5-31N, dated 20 September 1973.

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7D/U - 1 March 1975

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
2DF4	2.5	EV8-3109	50	52	A	3	50	
2HA5	2.0	ET1-5076	30		B	3	60	
2HM5	2.0	ET1-5076	30		B	3	60	
2HQ5	2.0	ET1-5076	30		B	3	54	
3B22	2.5	ER0-2000	0	88	A	4	80	Diode No.1
3B22	2.5	ER0-3000	0	88	A	4	80	Diode No.2
4D32	6.3	HR6-0240	55		B	3	33	Cap=P: Use Hickok adapter 1050-107. CAUTION: with line voltage down, insert tube slowly, adjust line to normal position
5AR4	5.0	JS0-6000	0	70	A	7	40	Plate No.1
5AR4	5.0	JS0-4000	0	70	A	7	40	Plate No.2
6AC10	6.3	BT9-2040	30		B	3	28	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6AC10	6.3	BS7-5060	30		B	3	28	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6AC10	6.3	BV4-2030	30		B	3	28	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6AD10	6.3	BU8-3290	37		B	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6AD10	6.3	BU3-7625	18		B	3	32	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-4)
6AF9	6.3	FW8-1970	29		B	3	58	Pentode No.1 (use Hickok adapter 1704, selectors 1-0-0)
6AF9	6.3	FW1-4320	28		B	3	44	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-0)

6AF11	6.3	BV4-2390	20		C	3	63	Pentode section (use Hickok adapter 1704, selectors 3-4-5)
6AF11	6.3	BS6-8050	27		B	3	55	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6AF11	6.3	BS3-4070	20		B	3	55	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6AG11	6.3	BS8-7090	30		B	3	42	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6AG11	6.3	BS5-6040	30		B	3	42	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6AG11	6.3	BU0-2030	0	60	A	2	35	Diode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6AG11	6.3	BU0-3020	0	60	A	2	35	Diode No.2 (use Hickok adapter 1704, selectors 0-0-4)
6AL11	6.3	BU8-3290	35		B	3	62	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6AL11	6.3	BV3-6724	8		B	3	18	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-5)
6AR11	6.3	BS4-8937	12		C	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
6AR11	6.3	BX5-2364	12		C	3	51	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
6U4	6.3	HY0-5030	0	66	A	7	40	
6AV11	6.3	BT9-2040	24		B	3	56	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6AV11	6.3	BS7-5060	24		B	3	56	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6AV11	6.3	BV4-2030	24		B	3	56	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6AX3	6.3	BS0-4070	0	54	A	7	40	Use Hickok adapter 1704, set adapter selectors to 0-0-2)
6AY3	6.3	EV0-2090	0	38	A	7	50	Use Hickok adapter 1704, set adapter selectors to 0-0-0)
6AY11	6.3	BS8-7090	20		B	3	26	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6AY11	6.3	BS5-6040	20		B	3	26	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6AY11	6.3	BU0-2030	0	60	A	2	35	Diode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6AY11	6.3	BU0-3020	0	60	A	2	35	Diode No.2 (use Hickok adapter 1704, selectors 0-0-4)
6B10	6.3	BV3-4020	29		C	3	28	Triode No.1 (use Hickok adapter 1704, selectors 0-0-5)

6B10	6.3	BS5-6070	29		C	3	28	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6B10	6.3	BS0-8090	0	53	A	2	40	Diode No.1 (use Hickok adapter 1704, selectors 8-0-2)
6BA11	6.3	BS4-6387	10		B	3	19	Pentode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6BA11	6.3	BW4-2385	10		B	3	19	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-6)
6BA11	6.3	BU9-3020	33		B	3	45	Triode section (use Hickok adapter 1704, selectors 2-3-4)
6BD11	6.3	BT5-2490	27		C	3	38	Pentode section (use Hickok adapter 1704, selectors 4-5-3)
6BD11	6.3	BS6-8050	29		B	3	38	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6BD11	6.3	BS3-4070	24		B	3	54	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6BF11	6.3	BS8-3490	31		D	3	33	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
6BF11	6.3	BY3-7625	26		B	3	10	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-8)
6BH11	6.3	BU8-2930	19		C	3	38	Pentode section (use Hickok adapter 1704, selectors 2-3-4)
6BH11	6.3	BS6-7050	13		D	3	42	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
6BH11	6.3	BV4-3020	13		D	3	42	Triode No.2 (use Hickok adapter 1704, selectors 0-0-5)
6BK4	6.3	HS0-5010	0	70	A	2	17	
6BS3	6.3	EV0-2090	0	60	A	7	42	Use Hickok adapter 1704, selectors 0-0-0
6BW11	6.3	BU3-8927	10		D	3	30	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6BW11	6.3	BX3-5426	26		B	3	52	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
6C10	6.3	BT9-2040	12		B	3	32	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6C10	6.3	BS7-5060	12		B	3	32	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6C10	6.3	BV4-2030	12		B	3	32	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6CJ3	6.3	EV0-2090	0	70	A	7	40	Use Hickok adapter 1704, selectors 0-0-0

6D10	6.3	BT9-2040	29		B	3	34	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6D10	6.3	BS7-5060	29		B	3	34	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6D10	6.3	BV4-2030	29		B	3	34	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6DQ6B	6.3	HS5-0480	36		D	3	30	Cap connects to plate
6DW4	6.3	EV0-2090	0	66	A	7	40	Use Hickok adapter 1704, selectors 0-0-0
6EH4	6.3	BS0-6050	0	70	A	2	17	Cap=G. Use Hickok adapter 1704, selectors 0-0-2
6GE5	6.3	BV4-7230	36		D	3	30	Use Hickok adapter 1704, selectors 3-4-5
6CJ7	6.3	EV2-6710	25		B	3	60	Pentode section
6CJ7	6.3	EV9-8030	40		B	3	44	Triode section
6GV5	6.3	BU9-0320	36		D	3	30	Cap=Plate. Use Hickok adapter 1704, selectors 2-3-4
6HA5	6.3	ET1-5076	30		B	3	60	
6HM5	6.3	ET1-5076	30		B	3	60	
6HQ5	6.3	ET1-5076	30		B	3	54	
6J11	6.3	BU3-9782	26		B	3	52	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6J11	6.3	BX5-3264	26		B	3	52	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
6JB6	6.3	EV2-0138	34		D	#	38	Cap=Plate. Use Hickok adapter 1704, selectors 0-0-0. #Hold down push button 2-DIODE and press button 3-MUT.COND.
6JE6	6.3	EV2-0738	53		D	3	34	Cap=Plate. Use Hickok adapter 1704, selectors 0-0-0
6JF6	6.3	EV2-0138	55		D	3	45	Cap=Plate. Use Hickok adapter 1704, selectors 0-0-0
6JM6	6.3	BW5-0324	48		D	3	32	Cap=Plate. Use Hickok adapter 1704, selectors 4-0-6
6JN6	6.3	BW5-7324	48		D	3	32	Use Hickok adapter 1704, selectors 0-5-6
6JS6	6.3	BW5-0324	82		C	3	52	Cap=Plate. Use Hickok adapter 1704, selectors 0-0-6

6JU8	6.3	EV0-8090	0	70	A	2	40	Diode No.1
6JU8	6.3	EV0-7080	0	70	A	2	40	Diode No.2
6JU8	6.3	EV0-2030	0	70	A	2	40	Diode No.3
6JU8	6.3	EV0-1020	0	70	A	2	40	Diode No.4
6K11	6.3	BT9-2048	24		B	3	56	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6K11	6.3	BS7-5068	12		B	3	32	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6K11	6.3	BV4-2038	12		B	3	32	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6KT6	6.3	EV2-7819	22		C	3	52	
6KT8	6.3	EV7-9860	15		C	3	57	Pentode section
6KT8	6.3	EV2-3010	26		B	3	38	Triode section
6LC6	6.3	HS0-5061	0	70	A	2	17	Cap=Grid
6LF6	6.3	BW5-0324	70		D	3	38	Cap=Plate. Use Hickok adapter 1704, selectors 0-0-6
6LQ8	6.3	EV7-9860	32		B	3	40	Pentode section
6LQ8	6.3	EV2-3010	33		B	3	35	Triode section
6Q11	6.3	BT9-2048	24		B	3	56	Triode No.1 (use Hickok adapter 1704, selectors 2-0-3)
6Q11	6.3	BS7-5068	12		B	3	32	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
6Q11	6.3	BV4-2038	12		B	3	32	Triode No.3 (use Hickok adapter 1704, selectors 0-4-5)
6T10	6.3	BU8-3290	35		B	3	62	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
6T10	6.3	BU3-7625	8		B	3	18	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-4)
7GV7	7.5	EV7-3280	29		B	3	33	Pentode section
7GV7	7.5	EV9-1080	38		C	3	47	Triode section
7HG8	7.5	EV2-8930	25		?	3	55	Pentode section

7HG8	7.5	EV6-7030	44	?	3	30	Triode section
8A8	10.0	EV2-6371	19	C	3	34	Pentode section
8A8	10.0	EV9-1086	34	C	3	36	Triode section
8AR11	7.5	BS4-8937	12	C	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
8AR11	7.5	BX5-2364	12	C	3	51	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
8BA11	7.5	BS4-6387	10	B	3	19	Pentode No.1 (use Hickok adapter 1704, selectors 0-0-2)
8BA11	7.5	BW4-2385	10	B	3	19	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-6)
8BA11	7.5	BU9-3020	33	B	3	45	Triode section (use Hickok adapter 1704, selectors 2-3-4)
8BM11	7.5	BU3-7928	20	C	3	40	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
8BM11	7.5	BX6-2354	25	C	3	31	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
9A8	10.0	EV2-6371	19	C	3	34	Pentode section
9A8	10.0	EV9-1086	34	C	3	36	Triode section
9KZ8	10.0	EV2-6370	19	C	3	38	Pentode section
9KZ8	10.0	EV9-1080	13	D	3	42	Triode section
10JA8	10.0	EV7-9860	27	C	3	32	Tetrode section
10JA8	10.0	EV2-3010	27	B	3	39	Triode section
10JY8	10.0	EV7-9860	20	C	3	63	Pentode section
10JY8	10.0	EV2-3010	33	B	3	35	Triode section
11AR11	10.0	BS4-8937	12	C	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
11AR11	10.0	BX5-2364	12	C	3	51	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)
11BQ11	10.0	BS4-8937	12	C	3	51	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
11BQ11	10.0	BX5-2364	26	B	3	52	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-7)

11BT11	10.0	BV4-2386	32		B	3	45	Pentode section (use Hickok adapter 1704, selectors 3-4-5)
11BT11	10.0	BS5-7060	23		C	3	29	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
11BT11	10.0	BS3-9040	20		C	3	43	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
11CA11	10.0	BU8-3297	30		C	3	37	Pentode section (use Hickok adapter 1704, selectors 2-3-4)
11CA11	10.0	BS6-4050	25		C	3	45	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
11CA11	10.0	BU3-2070	23		C	3	29	Triode No.2 (use Hickok adapter 1704, selectors 0-0-4)
11FY7	10.0	BU2-3090	22		B	3	20	Triode No.1 (use Hickok adapter 1704, selectors 2-3-4)
11FY7	10.0	BS3-5070	54		D	3	38	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
11HM7	10.0	EV2-7819	13		D	3	61	
11LQ8	10.0	EV7-9860	32		B	3	40	Pentode section
11LQ8	10.0	EV2-3010	33		B	3	35	Triode section
11LT8	10.0	EV9-3216	10		D	3	38	Pentode section
11LT8	10.0	EV0-8070	0	70	A	2	40	Diode No.1
11LT8	10.0	EV0-6070	0	70	A	2	40	Diode No.2
12AX3	12.6	BS0-4070	0	54	A	7	40	Use Hickok adapter 1704, selectors 0-0-2
12BF11	12.6	BS8-3490	31		D	3	33	Pentode No.1 (use Hickok adapter 1704, selectors 4-3-2)
12BF11	12.6	BY3-7625	26		B	3	10	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-8)
12BS3	12.6	EV0-2090	0	60	A	7	42	Use Hickok adapter 1704, selectors 0-0-0
12BY7A	12.6	EV2-7813	9		D	3	46	
12T10	12.6	BU8-3290	35		B	3	62	Pentode No.1 (use Hickok adapter 1704, selectors 2-3-4)
12T10	12.6	BU3-7625	8		B	3	18	Pentode No.2 (use Hickok adapter 1704, selectors 0-0-4)
14BL11	12.6	BV4-2380	32		B	3	45	Pentode section (use Hickok adapter 1704, selectors 3-4-5)

14BL11	12.6	BS5-7060	23		C	3	29	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
14BL11	12.6	BS3-9040	20		C	3	43	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
14BR11	12.6	BW2-5340	27		C	3	38	Pentode section (use Hickok adapter 1704, selectors 0-5-6)
14BR11	12.6	BS8-6050	29		B	3	38	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
14BR11	12.6	BT2-9070	24		B	3	54	Triode No.2 (use Hickok adapter 1704, selectors 2-0-3)
15AF11	12.6	BS6-8050	27		B	3	55	Triode No.1 (use Hickok adapter 1704, selectors 0-0-2)
15AF11	12.6	BS3-4070	20		B	3	55	Triode No.2 (use Hickok adapter 1704, selectors 0-0-2)
15BD11	12.6	BV4-2390	27		C	3	38	Pentode section. MAKE LINE TEST AT 64. Use Hickok adapter 1704, selectors 3-4-5
15BD11	12.6	BS6-8050	29		B	3	38	Triode No.1. MAKE LINE TEST AT 64. Use Hickok adapter 1704, selectors 0-0-2
15BD11	12.6	BS3-4070	24		B	3	54	Triode No.2. MAKE LINE TEST AT 64 .Use Hickok adapter 1704, selectors 0-0-2
17AX3	20.0	BS0-4070	0	54	A	7	40	MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 0-0-2
17BE3	20.0	BT0-2070	0	66	A	7	40	MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 2-0-3
17BF11	20.0	BU8-3290	31		D	3	33	Pentode No.1. MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 2-3-4
17BF11	20.0	BU3-7625	26		B	3	10	Pentode No.2. MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 0-0-4
17BS3	20.0	EV0-2090	0	60	A	7	42	MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 0-0-0
17GV5	20.0	BU9-3020	36		D	3	30	Cap=P. MAKE LINE TEST AT 56. Use Hickok adapter 1704, selectors 2-3-4
866	3.0	ER0-0000	0	67	A	7	40	Cap connects to Plate
6293	6.3	HS5-0310	25		D	3	36	
6384	6.3	GY7-3510	34		D	3	27	

6540	6.3	DU7-1265	10	D	3	22	
6850	12.6	FT6-0140	22	C	3	56	Cap above octal pins 2 and 3 connects to plate. Use Hickok adapter 1050-107. Connect negative (-) end of a 30V battery to pin 2 of the Loctal socket
6850	12.6	FT2-0140	22	C	3	56	Cap above octal pins 6 and 7 connects to plate. Use Hickok adapter 1050-107. Connect negative (-) end of a 30V battery to pin 6 of the Loctal socket. Connect positive (+) end of the 20V battery (Eveready 413) to pin 4 of the Loctal socket for each test. CAUTION: disconnect battery between selector changes
6872	6.3	DU7-1265	27	B	3	45	
6883	12.6	HS5-0318	30	D	3	35	Cap connects to plate
7289	6.3	HS6-5080	18	E	3	50	TV-7/U, TV-7A/U, TV-7B/U Use adapter E107
7289	6.3	HS6-5080	78	F	3	50	TV-D7/U Use adapter E107
7308	6.3	EV7-6080	21	D	3	50	Triode No.1
7308	6.3	EV2-1030	21	D	3	50	Triode No.2
7587	6.3	DR4-0280	10	D	#	38	Cap connects to plate. Use Hickok adapter 1050-127. #Hold down push button 2-DIODE and press push button 3-MUT.COND.
7788 E810F	6.3	EV2-7938	29	C	3	50	
7854	12.6	HR6-0340	35	C	3	60	Plate No.1 Use Hickok adapter 1050-107. Connect the negative end of a 30V battery to pin 2 of the large 7.pin socket. Connect the positive end of the battery to pin 4 of the large 7-pin socket. Connect the plate jack connector to the cap pin over pin 6 of the octal socket
							Plate No.2 Use Hickok adapter 1050-107. Connect the negative end of a 30V battery to pin 6 of the large 7.pin

7854	12.6	HR2-0340	35		C	3	60	socket. Connect the positive end of the battery to pin 4 of the large 7-pin socket. Connect the plate jack connector to the cap pin over pin 3 of the octal socket. CAUTION: disconnect the battery before changing selector settings
7868	6.3	EV2-9730	10		D	3	42	Use Hickok adapter 1050-144
7889	25.0	DW7-8050	13		D	3	13	Triode No.1
7889	25.0	DW2-1004	13		D	3	13	Triode No.2
7895	6.3	DR4-2080	17		D	3	32	Use Hickok adapter 1050-127
7905	6.3	BZ2-6307	50	47	A	3	50	
7984	12.6	BS3-5678	45		D	3	27	Use Hickok adapter 1704, selectors 5-0-4
8032	12.6	HS5-0318	30		D	3	35	Cap connects to plate
8077	12.6	EV2-7813	9		D	3	46	
8532	6.3	ET1-7020	15		D	3	45	

The following tubes CANNOT BE TESTED for the reasons stated:
5783WA - voltage reference tube. Model TV-7/U not suitable
5960 - required voltage and current not available in TV-7/U
6528 - too high powered to test
6798 - TR tube. Model TV-7/U not suitable
7077 - ceramic metal planar

							triode. Requires adapter not available 7815 - tube rated for pulse operations. Model TV-7/U not suitable

- **T.O. 33AA21-5-31Q, 5 September 1975**: This Publication supplements T.O. 33AA21-5-31 dated 17 January 1962

SUPPLEMENT
TEST DATA FOR ELECTRON TUBE TEST SETS TV-7( )/U - 5 September 1975

1. PURPOSE: This supplement is issued to change a filament in Data Table
2. INSTRUCTIONS: Page 19, Tube Type 6AU8: Change Filament 6.8 to 6.3 (Pentode sect.)

- **T.O. 33AA21-5-31R, 15 June 1983**: This Publication supplements T.O. 33AA21-5-31 dated 17 January 1962

SUPPLEMENT
TECHNICAL MANUAL
TEST DATA FOR ELECTRON TUBE TEST SETS TV-7( )/U - 15 June 1983

1. PURPOSE: The purpose of this supplement is to ammend the basic
2. INSTRUCTIONS: Page 39, on second line change tube type 13BE6 to 12BE6

- **T.O. 33AA21-5-31S, 31 May 1985**: This Publication supplements T.O. 33AA21-5-31 dated 17 January 1962

SUPPLEMENT
TECHNICAL MANUAL
TEST DATA FOR ELECTRON TUBE TEST SETS TV-7( )/U - 31 May 1985

1. LIST OF AFFECTED PAGES IN BASIC MANUAL: 71
2. SUPPLEMENTAL INFORMATION: Page 71, change first line, Tube Type Number '6320' to read '6360'

- **T.O. 33AA21-5-31T, 15 December 1986**: This Publication supplements T.O. 33AA21-5-31 dated 17 January 1962

TM 11-6625-274-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL
MAINTENANCE MANUAL

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U

JUNE 1960

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No. 11-6625-274-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *14 June 1960*

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

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*This manual supersedes so much of TM 11-5083, 29 September 1953, including C1, 2 September 1955; C2, 8 February 1956, and C3, 1 April 1959, as pertains to operation and organizational maintenance; so much of C4, 26 August 1959, as pertains to packaging and repackaging; TM 11-6625-274-10P, 11 June 1959, and so much of TM 11-6625-274-20P, 11 June 1959, as pertains to the maintenance allocation chart.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Sets, Electron Tube TV-7/U (fig. 1), TV-7A/U (fig. 2), TV-7B/U (fig. 3), and TV-7D/U (fig. 4), and covers installation, operation, and first and second echelon maintenance. It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to first and second echelon maintenance personnel.

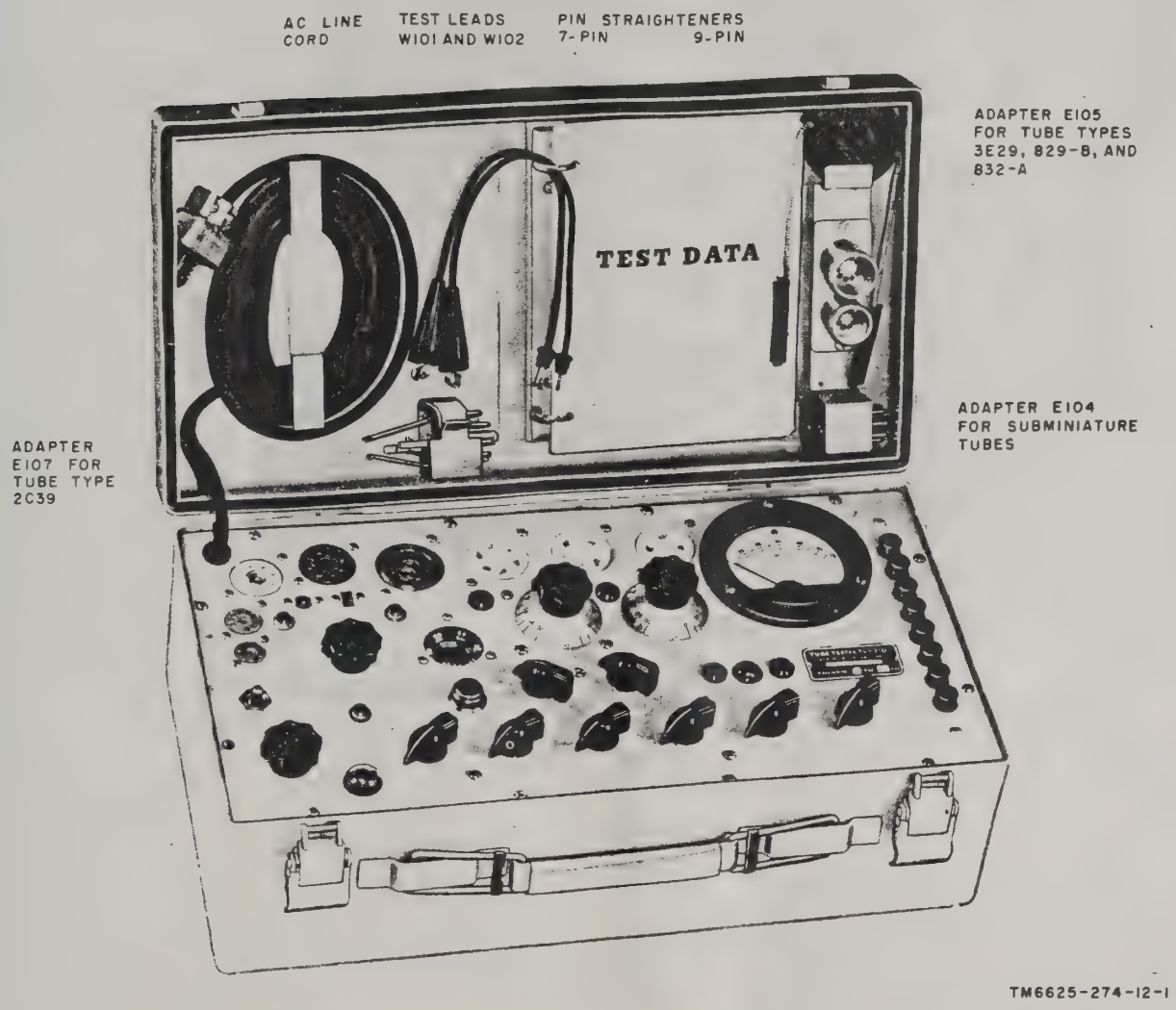
AC LINE CORD
TEST LEADS W101 AND W102
PIN STRAIGHTENERS 7-PIN 9-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST DATA
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
TM6625-274-12-1

Figure 1. Test Set, Electron Tube TV-7/U, less running spares.

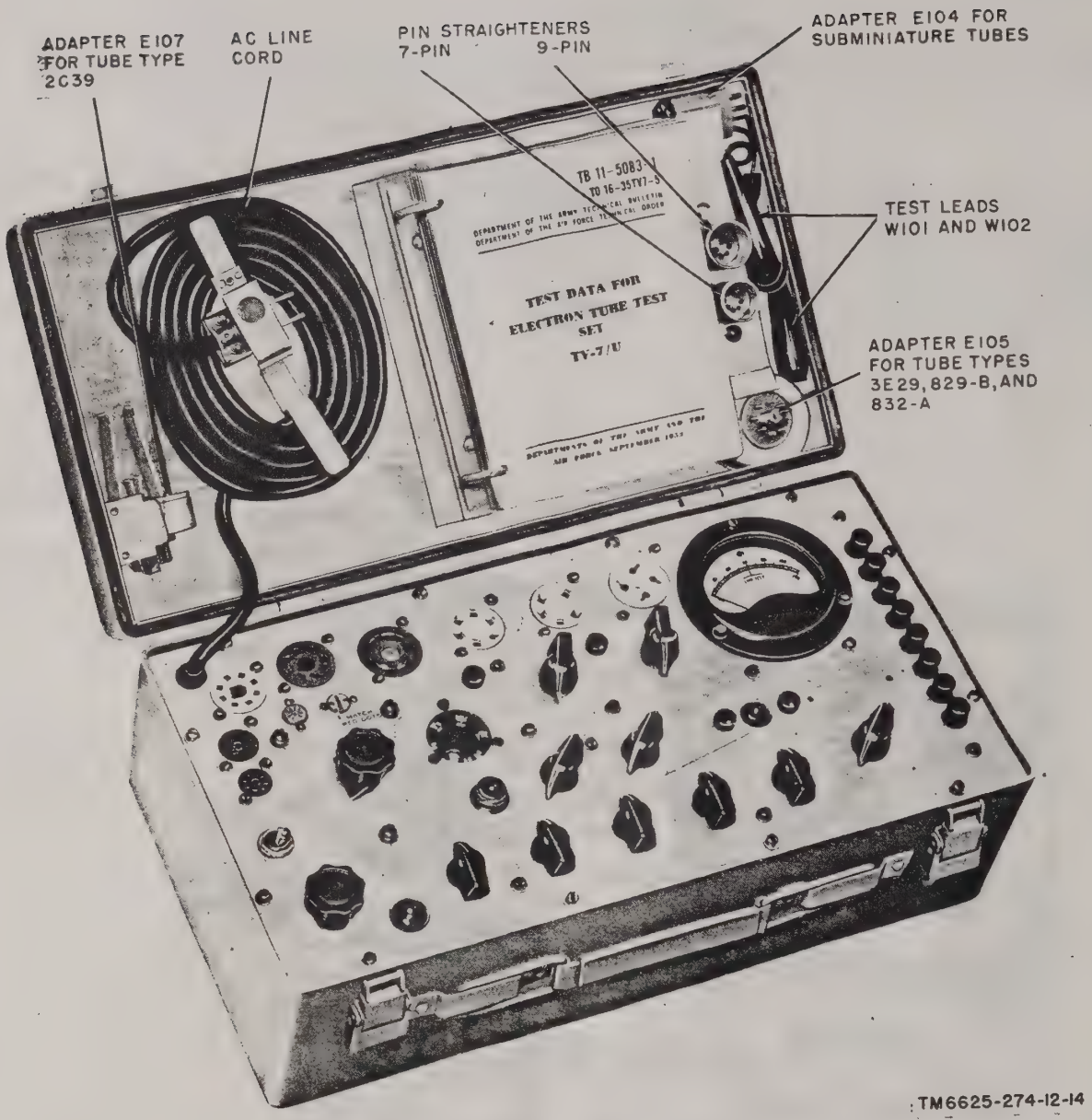

Figure 2. Test Set, Electron Tube TV-7A/U, less running spares.

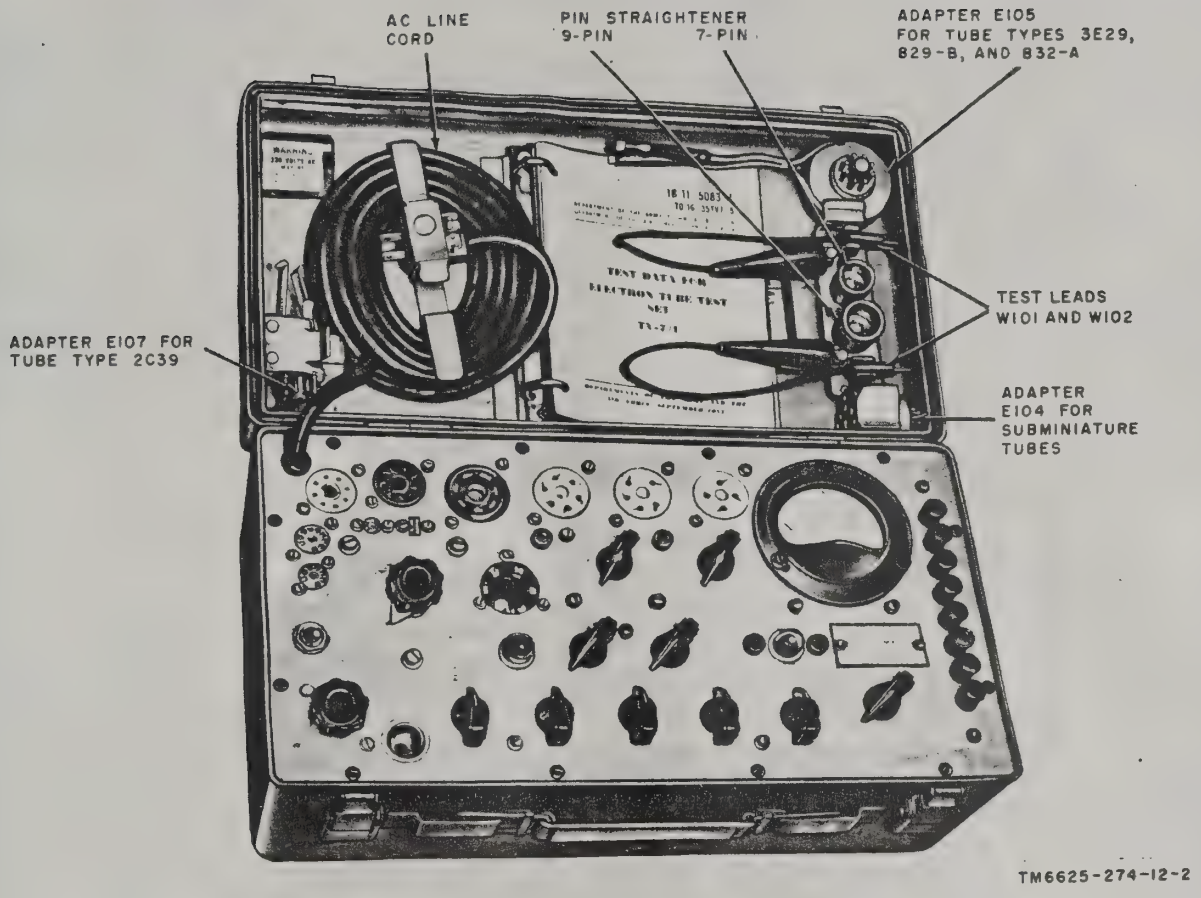
AC LINE CORD
PIN STRAIGHTENER 9-PIN
7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
TM6625-274-12-2

Figure 3. Test Set, Electron Tube TV–7B/U, less running spares.

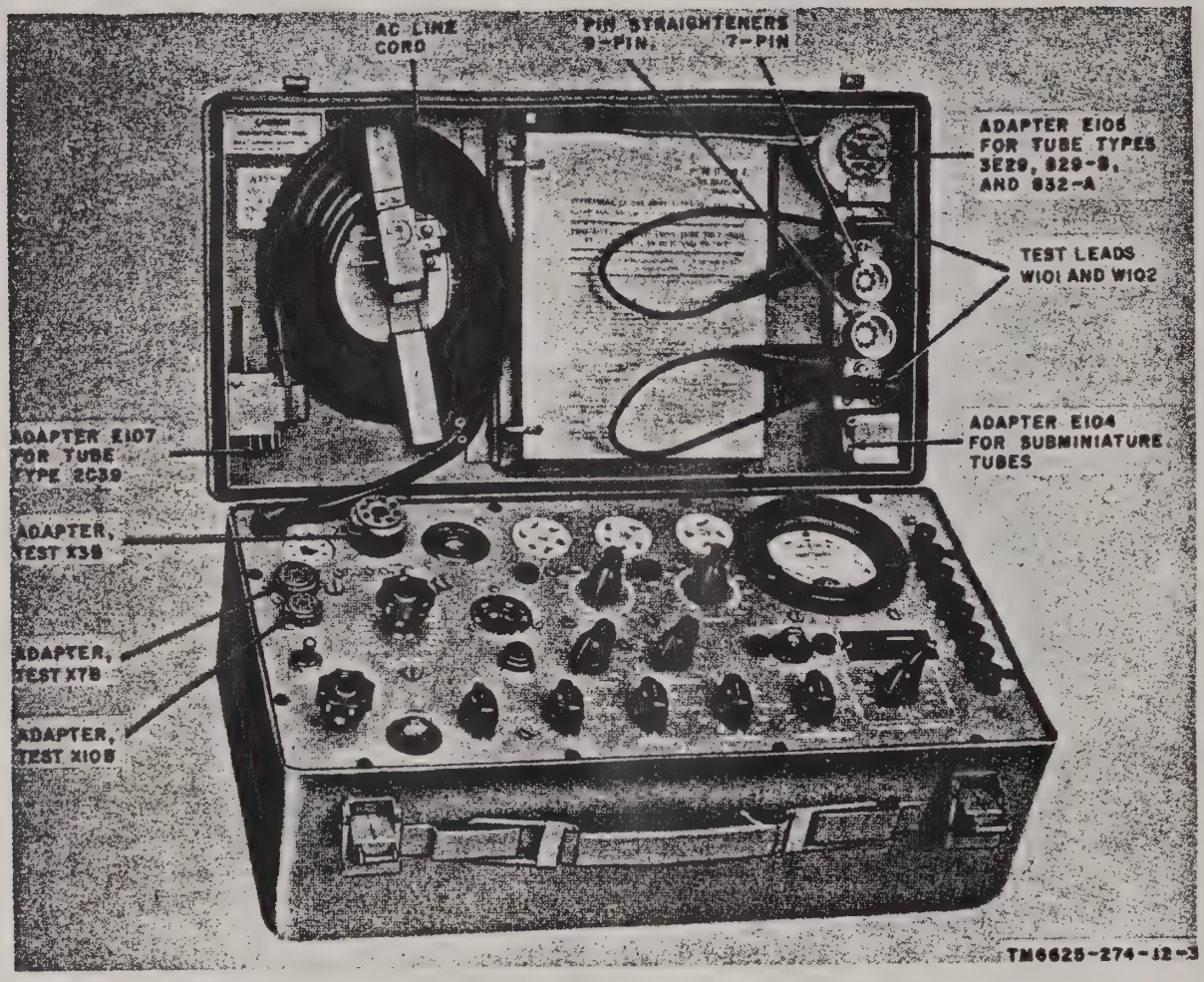
AC LINE CORD
PIN STRAIGHTENERS 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER, TEST X3B
ADAPTER, TEST X7B
ADAPTER, TEST X10B
TM6625-274-12-3

Figure 4. Test Set, Electron Tube TV–7D/U, less running spares.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Test Set, Electron Tube TV-7(*)/U represents Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

2. Forms and Records

a. Electronic Failure Report. Fill out and forward DD Form 787-1, Electronic Failure Report-Signal Equipment, to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-39.

b. Unsatisfactory Equipment Report. Fill out and forward AF TO Form 29, Unsatisfactory Report, to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

c. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6, Report of Damaged or Improper Shipment, as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

d. Preventive Maintenance Form. Prepare DA Form 11-266 (fig. 11 and 12), Maintenance Check List for Signal Equipment (Test Equipment), in accordance with instructions on the form.

e. Parts List Form. Any comments concerning omissions and discrepancies in appendix II or III in this manual will be prepared on DA Form 2028 and forwarded directly to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J. ATTN: SIGFM/ES-ML.

f. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Test Set, Electron Tube TV-7(*)/U is a portable tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limits for electron tubes used in receivers, low-powered transmitters, and many other electronic equipments. The following tests can be made with Test Set Electron Tube TV-7(*)/U:

a. Continuity test (ballast tubes).

b. Dynamic mutual conductance test (amplifier tubes).

c. Emission test (rectifier tubes).

d. Gas test (amplifier tubes).

e. Noise test.

f. Panel lamp test.

g. Shorts test.

4. Technical Characteristics

Power Supply:	
Input voltage	103.5 to 126.5 volts ac, single phase.
Frequency	50 to 1,000 cps.
Power consumption ..	45 watts at 115 volts, 50 cps.
Meter	0 to 120 arbitrary units.
Operating temperature limits	—40° to +125° Fahrenheit.
Number of tubes	2.
Indicator lights:	
PILOT	One type 47.
SHORTS	One type NE-45.
FUSE	One type 81.

5. Table of Components

The components of Test Set, Electron Tube TV-7(*)/U are listed in *a* below and the spare parts in *b* below.

a. Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Length	
1	Test set including tubes and lamps	6 1/16	8¾	15¾	18
1	Adapter E105: 8E29, 829-B or 832-A tubes				
1	Adapter E107: 2C39 tube				
1	Adapter E104: Subminiature tubes				
1	Adapter X10B: socket saver, 7-pin miniature (TV-7D/U)				
1	Adapter X7B: socket saver, 9-pin miniature (TV-7D/U)				
1	Adapter X8B: socket saver, octal (TV-7D/U)				
2	Test leads				
1 set	Running spares (*b* below)			15	

b. Spare Parts.

Quantity	Item
1	Electron tube, type 5Y3WGTA
1	Electron tube, type 83
1	Lamp, neon NE-45
1	Lamp, incandescent No. 47
1	Lamp, incandescent No. 81

6. Description of Test Set

(fig. 1-4)

a. Test Set, Electron Tube TV-7(*)/U (test set) is self-contained in a carrying case equipped with a carrying handle. The cover is secured to the case by luggage-type fasteners. Retainer brackets on the inside of the cover are used to secure and store the power cable, pin straighteners for 7- and 9-pin miniature tubes, and adapters (par. 16). A ring binder inside the cover holds TB 11-5083-1 (tube test data book (par. 15)). The cover is hinged by slip hinges and can be removed from the case.

b. An indicating meter and all controls, knobs, pushbuttons, sockets, and indicating lamps are on the front panel. The necessary data for setting and operating the controls to test the various tube types are contained in the tube test data book (*a* above). One end of the alternating current (ac) line cord is permanently attached to the panel; the other end terminates in a male plug.

7. Differences in Models

Test Sets, Electron Tube TV-7(*)/U are similar in purpose, operation, and appearance. Some models have been modified to improve operational features. External differences are as follows:

Item	TV-7/U	TV-7A/U	TV-7B/7	TV-7B/U
F RANGE on FUNCTION SWITCH.	Not used.	Not used.	Not used.	Used.
BIAS and SHUNT controls	Markings engraved on a dial.	Markings etched into test set panel.	Markings etched into test set panel.	Markings etched into test set panel.
SHORTS lamp	No panel marking.	Panel marking.	Panel marking.	Panel marking.
Subminiature tube test socket X109.	Rectangular.	Round on some equipments.	Rectangular.	Rectangular.
Storage clip for ac line cord plug.	Not used.	Used.	Used.	Used.
Storage clips for test leads	Not used.	Not used.	Used.	Used.
Tip of test lead plug (2 each)	3/32-inch diameter.	5/64-inch diameter.	3/32-inch diameter.	3/32-inch diameter.

Item	TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
Grid (G), plate (P), and NOISE jacks.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 5/64-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.
Gasket around edge of cover	Not used.	Used.	Used.	Used.
Socket saver adapters X10B, X7B, and X3B, 7-pin and 9-pin miniature and octal base.	Not provided.	Not provided.	Not provided.	Provided.

CHAPTER 2
INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the test set is packaged in an inner fiberboard carton. Spare parts are in a small, corrugated carton, protected by a sleeve on top of the test set. The inner fiberboard carton is sealed with gummed tape, and is then placed within an outer fiberboard carton, with all seams and joints sealed with water-resistant, pressure-sensitive tape. A wooden packing case may also be used when a multiple of four test sets is shipped. The wooden packing case will be strapped only for intertheater shipment. A typical packing case and its contents are shown in figure 5.

(1) The inside dimensions of a packing case that contains four packaged test sets is approximately 18¾ by 20½ by 15¾ inches; the volume is 4.8 cubic feet, and the weight is 106 pounds.

(2) The outside dimensions of a test set packed in fiberboard cartons is 21½ by 10⅞ by 8½ inches; the volume is

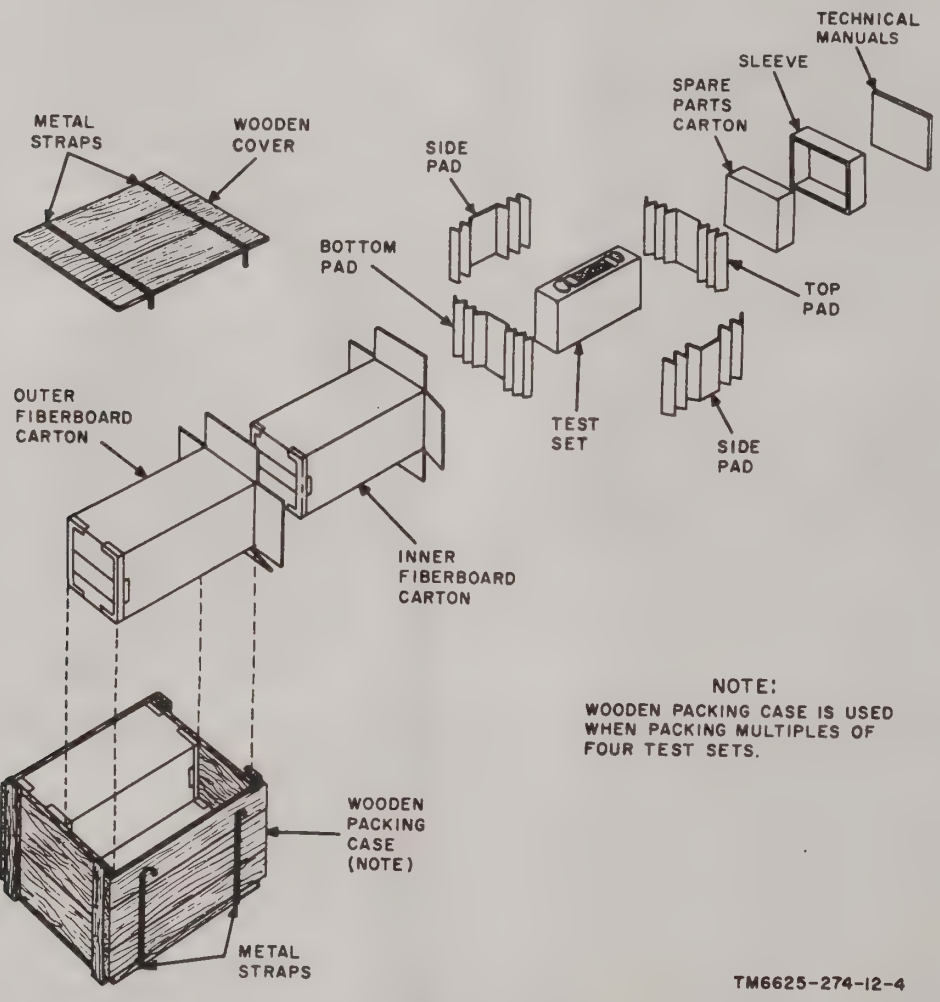

Figure 5. Typical packaging.

1,2 cubic feet, and the weight is 21½ pounds.

b. Removing Contents.

(1) Cut and fold back the metal straps (when used).

(2) Remove the nails from the wooden cover and one side of the wooden packing case with a nailpuller. Remove the cover and the side. Do not attempt to pry off the cover or the side; prying may damage the equipment.

(3) Remove the envelope that contains the technical manuals.

(4) Remove the outer fiberboard carton from the wooden packing case.

(5) Open the outer fiberboard carton and remove the inner fiberboard carton.

(6) Open the inner fiberboard carton and remove the contents.

9. Checking Unpacked Equipment

Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (par. 5) as a general check. If the equipment is damaged, refer to paragraph 2. After a test set is removed from its fiberboard container, release the fasteners, open the cover, and proceed as follows:

a. Check to see that the adapters (fig. 8) are held firmly to the cover.

b. Check all controls for ease of rotation. Tighten loose knobs.

c. Check for a broken meter glass and broken lamps.

d. Check the ac line cord, test leads, and rubber gasket around the edge of the cover (except on TV-7/U) for signs of deterioration.

Section II. CONTROLS AND INDICATORS

10. General

Improper setting of the FILAMENT VOLTAGE switch (fig. 6) or incorrect operation of the pushbutton switches may damage the tube under test. Be sure that all the controls and switches are set properly before testing tubes.

11. Controls, Indicators, and Jacks

a. Switches and Controls.

Switch or control	Function
POWER switch	ON: Connects ac power to test set. OFF: Removes ac power from test set.
FILAMENT VOLTAGE (20-position rotary switch)	Provides an 18-step selection of filament voltages from 0.6-volt to 117 volts ac. BLST.: Enables ballast tubes to be tested for continuity and supplies voltage to certain rectifier tubes for emission tests.
	OFF: Removes voltage from FILAMENT VOLTAGE switch.
FILAMENT selectors, left and right (10-position, 5-section rotary switches)	Connects filament of tube under test to filament voltage supply.
GRID selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects control grid of tube under test to bias and signal voltages.
PLATE selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects plate of tube under test to plate voltage supply.
SCREEN selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects screen grid of tube under test to screen voltage supply.
CATHODE selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects cathode of tube under test to desired test circuit.
SUPPRESSOR selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects suppressor grid of tube under test to desired test circuit.

Switch or control	Function
FUNCTION SWITCH (11-position, 8-section rotary switch (TV–7D/U), 10-position, 6-section rotary switch on all other models)	SHORTS: Positions 1-5 connect various elements of tube under test to shorts test circuit. RANGES: Positions A-E (A-F, TV–7D/U) control sensitivity of meter circuit and magnitude of signal voltage.
LINE ADJUST control	Adjusts amount of input voltage to power transformer.
BIAS control	Adjusts amount of bias voltage applied to tube under test.
SHUNT control	Adjusts sensitivity of meter circuit.

b. Pushbutton Switches.

Pushbutton switch	Function	
	Switch position	*Action*
1—LINE ADJ.	Depressed	Connects meter into line test circuit.
	Normal	Disconnects meter from line test circuit.
2—DIODE	Depressed	Connects diode tube under test to an ac test voltage, and connects low screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed. [a]
	Normal	Removes ac test voltage from diode under test and connects normal screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed.
3—MUT. COND.	Depressed	Connects tube under test to plate and screen grid (when required) voltages.
	Normal	Removes plate and screen grid (when used) voltages from tube under test.
4—GAS 1	Depressed	Connects ac test voltage to certain diode tubes and connects plate voltage and bias voltage to tube under test when checking amplifier tubes for gas.
	Normal	Removes diode test voltage or plate voltage and bias voltage from amplifier tube under test.
5—GAS 2 (used with 4—GAS 1 when amplifier tubes are tested for gas)	Depressed	Connects a resistor into control grid circuit of tube under test.
	Normal	Short-circuits resistor in control grid circuit of tube under test.
6—OZ4	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
7—RECT.	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
8—METER REV.	Depressed	Reverses polarity of voltage applied to meter.
	Normal	Permits normal polarity of voltage to be applied to meter.

[a] Voltage will vary slightly, depending on LINE ADJUST setting.

c. Meter, Indicator Lamps, and Jacks.

Note. The jacks on the TV–7A/U accommodate 5/64-inch diameter tip plugs; the jacks on all other models of the test set accommodate 3/32-inch diameter tip plugs.

Meter, indicator lamp, or jack	Function
Meter	Indicates condition of tube under test. A LINE TEST mark at midscale is used to establish correct input voltage to power transformer.
SHORTS lamp (not a panel marking on TV–7/U)	Indicates and locates shorted tube elements.
PILOT lamp	Indicates when power is delivered to test set.
FUSE lamp	A fuse and an overload indicator.
Grid (G) and plate (P) jacks	Provide a means of connecting grid and plate test leads to bias and plate voltage circuits, respectively.
NOISE test jacks (2)	Enables test set operator to check level of noise generated by tube under test.

Section III. OPERATION UNDER USUAL CONDITIONS

12. General Instructions

Do not operate the test set until the functions of the controls and the indicators (par. 11), the operating procedure (par. 18), and the use of the test data book (par. 15) are understood. Refer to paragraph 24 whenever a special testing procedure is indicated in the test data book.

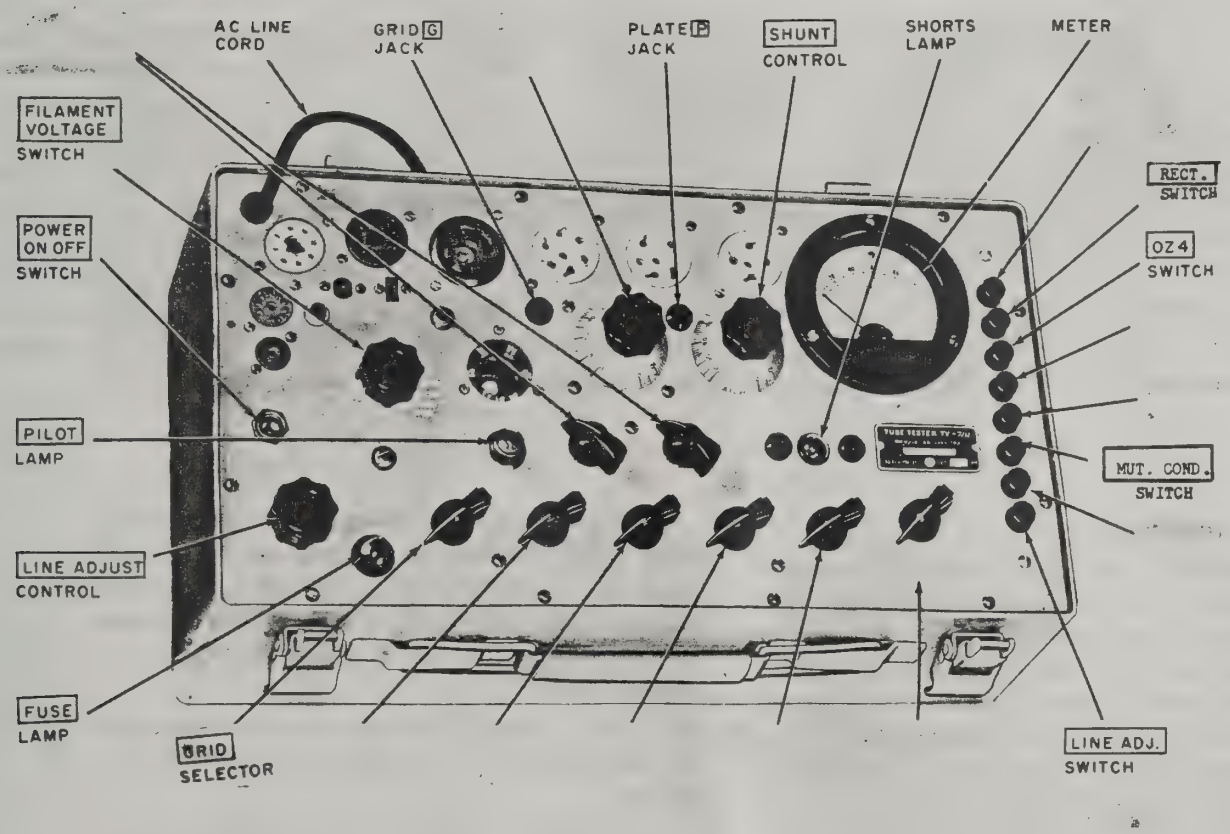

Figure 6. Test Set, Electron Tube TV–7/U, front panel.

13. Test Leads

Two test leads are provided to make connections from the grid (G) and the plate (P) panel jacks to the top caps of tubes under test. Each test lead is terminated on one end in a 3/32-inch diameter tip plug (5/64-inch on TV-7A/U) and on the other end in a battery-type clip with an insulating cover. The test leads are stored inside the cover of the test set case.

14. Tube Test Sockets

(fig. 7)

After the controls on the test set have been set as directed in the tube test data book (par. 15), place the tube to be tested in the proper tube test socket listed below. Socket-saver adapters (par. 16*d*) are mounted in the 7- and 9-pin miniature sockets and in the octal socket on the TV-7D/U (fig. 4).

Tube test socket	Tube type tested
4 pin	Four-pin standard tubes.
5 pin	Five-pin standard tubes.
6 pin	Six-pin standard tubes.
7 pin	Seven-pin standard tubes and panel lamps.
OCTAL	Octal (8-pin) tubes.
LOKTAL	Loktal base (8-pin) tubes.
SUB MIN. (2)	Round (8-pin) or flat-type (7-pin) subminiature tubes.
NOVAL	Nine-pin miniature tubes.
7 PIN MIN	Seven-pin miniature tubes.
ACORN	Acorn type tubes.

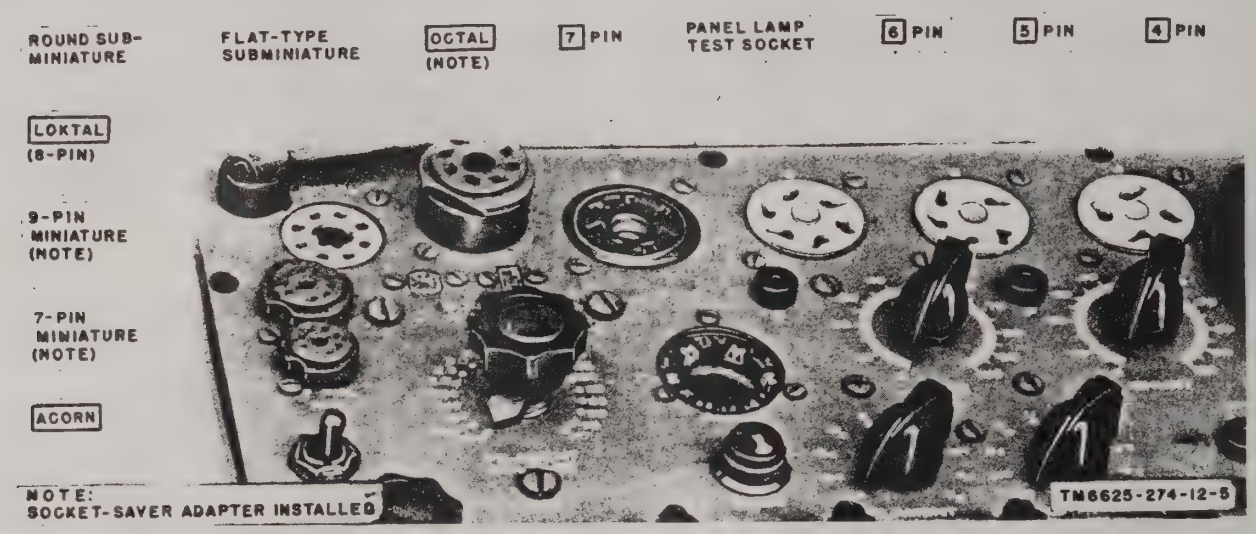

Figure 7. Test sockets, socket-saver adapters installed.

15. Tube Test Data

TB 11-5083-1 (test data book) is mounted on the inside of the cover of the test set. The test data book contains operating instructions for the test set, information necessary to set the controls when testing various tube types, a conversion table for VT tube designations, and a data table for CV type tubes. The control settings for the various tube types are tabulated in nine columns. Read the headings from left to right as follows:

a. Tube Type. Type numbers of electron tubes which the test set is designed to test are listed numerically and alphabetically in this column. Tubes that have type letters instead of numbers, such as XXB, are listed at the end of the table.

b. Fil. Correct filament or heater voltages for the listed tube types are shown in this column.

c. Selectors. The correct setting for the two FILAMENT selectors and the GRID, PLATE,

SCREEN, CATHODE, and SUPPRESSOR selectors are listed in this column. The settings are shown in the same order in which the switches appear on the panel, listing first the two FILAMENT selectors and then continuing, from left to right, with the remaining selectors.

d. Bias. This column lists the setting for the BIAS control.

e. Shunt. This column lists the setting for the SHUNT control. Setting of this control is required only when the FUNCTION SWITCH is in the RANGES A SHUNT position.

f. Range. The settings for the FUNCTION SWITCH are listed in this column. The letters A through E (A through F, TV-7D/U) correspond to the RANGES markings for the FUNCTION SWITCH.

g. Press. Under this heading are listed the test pushbuttons that are used for the various tube types and their individual sections in the case of multipurpose tubes.

h. Min Value. The minimum, numerical values of meter indication for the various tubes and individual sections of multipurpose tubes are shown in this column. Any tube showing a meter reading less than the value indicated in this column should be replaced.

i. Notations. Special information pertaining to particular tube types is listed under this heading.

16. Adapters

a. Adapter E104. Adapter E104 (fig. 8) enables subminiature tubes with long leads to be tested in the OCTAL socket of the test set. A spring locking action grips the leads of the tube after they are inserted in the adapter. Pull the two tabs upward to open the lock before inserting the leads. The lock is secured by pressing down on the two tabs until a click is heard.

b. Adapter E105. Adapter E105 (fig. 8) enables tube type 3E29, 829-B, or 832-A to be tested in the OCTAL socket of the test set. The adapter consists of a special socket for these tubes mounted on an octal base. The two leads on the adapter connect to the two plate caps of the tube under test.

c. Adapter E107. Adapter E107 (fig. 8) enables tube type 2C39 (a lighthouse tube) to be tested in the OCTAL socket of the test set. The three pairs of spring contacts, from the center outward, connect to the cathode and one side of the filament, to the grid, and to the plate, respectively, of the tube under test. The center contact connects to the other side of the filament of the tube under test.

d. *Socket-Saver Adapters (TV-7D/U).* Three socket-saver adapters (fig. 7) are included with each TV-7D/U: one 7-pin miniature, one 9-pin miniature, and one octal. The adapters are installed in their corresponding sockets and receive the wear rather than the permanent socket. When worn so that satisfactory contact can no longer be made, the socket-saver adapters can be replaced without disconnecting the leads from their respective test socket.

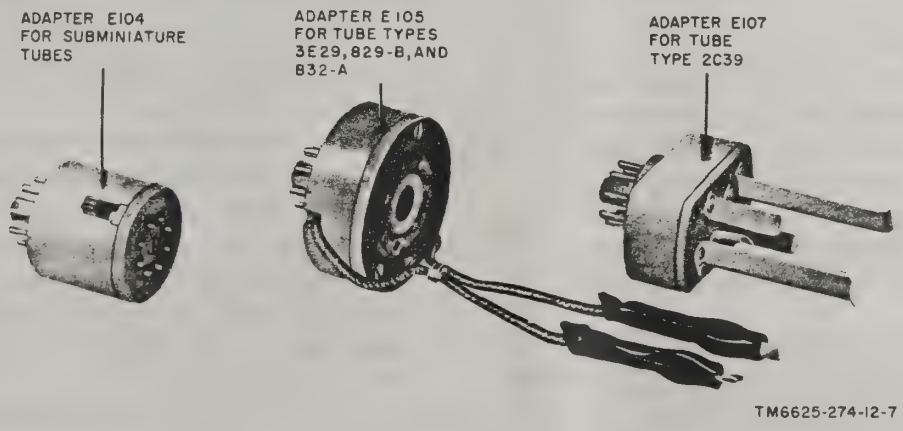

Figure 8. Adapters E104, E105, and E107.

Section IV. OPERATING TEST SET

17. Starting Procedure

Before operating the test set, perform the starting procedure below to check the general operation of the equipment. If the results obtained from the procedures in *b* through *e* below are satisfactory, the test set is ready for operation.

Note. If an abnormal indication is obtained during the starting procedure, refer to the equipment performance checklist (par. 35) for corrective measures.

a. Connect the test set to a 115-volt ac, 50- to 1,000-cycle per second (cps), power source.

b. Set the POWER switch to the ON position; the PILOT lamp should light.

c. Press pushbutton 1 — LINE ADJ. Rotate the LINE ADJUST control knob until the meter pointer rests over the LINE TEST mark on the meter face.

d. Release pushbutton 1 — LINE ADJ.

e. Check the short test circuit.

(1) Set the left FILAMENT selector at A, the right FILAMENT selector at P, and the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selectors at 0, 0, 0, 2, and 2, respectively.

(2) Rotate the FUNCTION SWITCH through the five SHORTS positions. The neon SHORTS lamp (fig. 6) should glow in positions 2 and 3 of the FUNCTION SWITCH to indicate that the short test circuit is functioning properly.

f. Set the POWER switch to the OFF position.

18. Operating Procedure

The procedures below apply to single-section and multipurpose tubes (tubes that have more than one set of elements in the same envelope). Test each section or group of elements of a multipurpose tube separately. Test data for the multipurpose tube types are listed by sections (pentode sect., triode sect., diode sect., etc) in the test data book.

Caution: **Do not insert a tube into a test socket until all the controls have been set in accordance with the instructions below.**

a. Selectors. The FILAMENT (left and right), GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches select the test socket connections so that correct test voltages are applied to the elements of the tube under test. For clarity, these selector switches will, in some instances, be referred to collectively as "the selectors". When referred to collectively, they are considered in the same order as above.

b. Setting Controls.

(1) Locate the type number of the tube to be tested in the test data book (fig. 1-4).

(2) Turn the FILAMENT VOLTAGE knob to the position shown in the *Fil* column of the test data book.

(3) Set the selectors to the letters and the numbers indicated in the *Selectors* column in the test data book. Be sure the numbers indicated by the selector knobs are the same, if read from left to right, as the numbers in the test data book.

Example: **To test a tube type 6SN7, the *Selectors* column in the test data book indicates that the selectors are to be set at HY4-5062. Start at the left and turn the FILAMENT (left) selector knob to H, and the FILAMENT (right) selector knob to Y. Turn the GRID selector knob to number 4; the PLATE selector knob to number 5; the SCREEN selector knob to number 0; the CATHODE selector knob to number 6; and the SUPPRESSOR selector knob to 2. The sequence of letters and numbers thus selected (HY4-5062) is identical with that listed in the test data book. The selectors are interconnected electrically so that two different voltages cannot be applied to the same tube pin at the same time. Therefore, accidental shorts are avoided.**

(4) Set the BIAS control to the number indicated in the *Bias* column of the test data book.

(5) Set the SHUNT control to the number indicated in the *Shunt* column of the test data book. If no setting is indicated, disregard this step and proceed with the steps below.

(6) Set the FUNCTION SWITCH knob to 1.

(7) Insert the tube to be tested in the

proper test socket (fig. 7) and, if the instructions in the *Notations* column require it, connect panel jacks G or P to the tube caps with the test leads.

(8) Set the POWER switch to the ON position. The PILOT lamp should light.

Note. For tubes of the heater cathode type, allow approximately 5 to 10 seconds for the cathode to reach operating temperature before testing the tube.

(9) Adjust the meter pointer (par. 17*c* and *d*) to the LINE TEST mark on the meter scale.

Note. Some tubes, such as the 17DE4 and the 32ET5, require the meter pointer to be set at a position other than the LINE TEST mark. Refer to the *Notations* column of the test data book before testing the tube.

c. Shorts Test.

(1) Turn the FUNCTION SWITCH knob from position 1 to position 5; meanwhile tap the tube lightly and watch the neon SHORTS lamp on each switch position. Tubes with shorted elements will cause the lamp to glow.

Note. A list of tubes that are not to be tapped during the shorts test is contained in the test data book.

(2) A short is indicated by a steady glow on *both* halves of the SHORTS lamp. A flash when the switch is turned from one position to another does not indicate a defective tube. Intermittent flashing when the tube is tapped indicates the existence of loose elements which can cause noisy or erratic operation.

(3) Tubes that have more than one section, such as the 25D8, must be tested for shorts on each section.

(4) Discard a shorted tube without further tests.

Note. Some tubes will show a shorted condition on certain positions of the FUNCTION SWITCH even though they are good tubes. Check the *Notations* column in the test data book for remarks. "Short on 1 and 2" would mean that a short indication in positions 1 and 2 is normal.

(5) If the tube is not shorted, other tests may be performed as required.

d. Selection of Range. Turn the FUNCTION SWITCH knob from the SHORTS side of the switch to the RANGES position indicated in the test data book under the column headed *Range*. This automatically sets the sensitivity of the meter circuit to the proper level for the tube under test.

e. Operating Pushbuttons.

***Caution:* Do not press pushbutton 3 — MUT. COND. when testing rectifier tubes.**

(1) Press the pushbutton (par. 11*b*) that is indicated in the *Press* column of the test data book.

***Caution:* Release the pushbutton as soon as the meter pointer comes to rest and the meter indication is read. If the pushbutton is depressed too long, the tube under test may be damaged.**

(2) Refer to the *Notations* column for special information pertaining to specific tube types.

(3) When the correct pushbutton is depressed, the meter will indicate the condition of the tube. Compare the meter reading to the value indicated in the *Min value* column of the test data book.

19. Checking Filament Continuity (12-Volt Filament Tubes)

Certain electron tubes in the 12-series may have open filament center taps that may not affect the testing or the operation of these tubes, if the tube is used in a 12-volt filament circuit. The test set does not have a specific filament continuity test circuit. A visual check for filament continuity of tube types 12AT7, 12AU7, 12AV7, 12AX7, and 12AZ7 can be made as follows:

a. Perform the starting procedures (par. 17).

b. Set the FILAMENT VOLTAGE switch to 12.6.

c. Set the left and right FILAMENT selector switches to E and to V, respectively.

d. Set the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches each at zero.

e. Insert the tube in its proper test socket and perform the procedures in paragraph 17*b* through *d*.

f. Observe the filament of the tube; both sides should be lighted.

Note. Do not prolong the continuity test; keep the filament lighted just long enough to make a thorough observation.

g. Set the POWER switch to the OFF position, and set the FILAMENT VOLTAGE switch to 6.3.

h. Set the left and right FILAMENT selector switches to K and V, respectively.

i. Perform the procedures in paragraph 17*b* through *d*.

j. Observe the filament of the tube; only one-half the filament should be lighted.

k. Set the POWER switch to the OFF position, and set the left and right FILAMENT selector switches to E and Z, respectively.

l. Perform the procedures in paragraph 17*b* through *d*.

m. Observe the filament of the tube; the other half of the filament should be lighted.

n. If the tube shows filament continuity, proceed to test the tube in accordance with the instructions in paragraphs 20 through 22.

20. Reading Meter

The meter scale is calibrated in divisions from 0 to 120. When the proper pushbutton is depressed, the meter pointer will indicate the condition of the tube under test as a numerical value. The numerical value of the meter reading is then compared to the minimum acceptable value in the *Min value* column in the test data book. If the number indicated on the meter is less than the listed minimum value, the tube should be replaced. The following chart may be used to convert the numerical value of the meter reading to mutual conductance in micromhos.

Meter reading	Corresponding value in micromhos			
	Range B	Range C	Range D	Range E (Note)
0	0	0	0	0
10	250	500	1,250	2,500
20	500	1,000	2,500	5,000
30	750	1,500	3,750	7,500
40	1,000	2,000	5,000	10,000
50	1,250	2,500	6,250	12,500
60	1,500	3,000	7,500	15,000
70	1,750	3,500	8,750	17,500
80	2,000	4,000	10,000	20,000
90	2,250	4,500	11,250	22,500
100	2,500	5,000	12,500	25,000
110	2,750	5,500	13,750	27,500
120	3,000	6,000	15,000	30,000

Note. Ranges E and F, TV–7D/U.

21. Gas Test

Pushbuttons 4 — GAS 1 and 5 — GAS 2 are used when testing amplifier tubes for gas content. Multipurpose tubes are tested for gas only on the amplifier sections; the gas test does *not* apply to diode sections or to rectifier tubes. Allow tubes of the filament type to warm up before testing the tube for gas content.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the controls as indicated in the test data book.

c. Insert the tube in the proper test socket and set the POWER switch to ON.

d. Hold down pushbutton 4 — GAS 1 and adjust the BIAS control (fig. 6) until the meter pointer indicates 10 on the scale.

Note. If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob until the meter reading is 100.

e. Hold down pushbutton 4 — GAS 1 and press pushbutton 5 — GAS 2.

f. If the tube contains gas, the meter pointer will move up the scale. A movement of more than 1 division on the scale indicates a gassy tube.

g. Turn off the test set (par. 26).

22. Noise Test

The NOISE test jacks on either side of the SHORTS lamp (fig. 6) are used when testing electron tubes for noise. A radio receiver or an audio amplifier with a loudspeaker, and a set of test leads, are required to perform the test.

a. Perform the starting procedures (par. 17).

b. Set the controls for the tube under test as indicated in the test data book, and set the POWER switch to ON.

c. Set the FUNCTION SWITCH to SHORTS 1.

d. Connect a test lead to each of the NOISE jacks.

e. Connect the test lead from the left-hand NOISE jack to the chassis of the radio receiver or the audio amplifier.

f. Connect the test lead from the right-hand NOISE jack to either the antenna of a radio receiver or to the input of an audio amplifier. Turn the radio receiver or the audio amplifier power switch to the on position.

g. Tap the tube under test while the FUNCTION SWITCH is turned from position 1 through position 5.

h. Intermittent disturbances within the tube which are too brief to register on the SHORTS lamp will be reproduced as static by the loudspeaker.

i. Turn off the test set (par. 26).

23. Panel Lamp Test

The receptacle in the center of the large, 7-pin socket (fig. 7) is used to check panel lamps.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the FILAMENT selector switches to HR.

c. Set the FILAMENT VOLTAGE switch to the proper voltage for the lamp to be tested. If the exact voltage is not known, set the FILAMENT VOLTAGE switch to 0.6 volt and increase the voltage as required.

d. Insert the lamp in the receptacle and press the center contact of the lamp firmly against the bottom of the receptacle; then tilt the lamp until the metal shell makes contact with the rim of the receptacle. A defective lamp will not light.

e. Turn off the test set (par. 26).

24. Testing Special Tube Types

a. Special Testing Procedures. Certain electron tubes, such as the 6CD7, 6DA5, 6360, and 6524, require a special testing procedure. The 1-megohm resistors required to test the 6CD7 and the 6DA5, and the 30-volt battery required to test the 6360 and the 6524, are not supplied with the test set. The selectors are set for the tube under test in the normal manner. However, *before* the POWER switch is set to the ON position, the resistors or the battery is connected to the test socket pins as directed in the test data book.

Caution: **Disconnect the 30-volt battery *before* resetting any of the selector switches.**

b. Voltage Regulators. When voltage regulator tubes are tested, sufficient voltage must be applied to ionize the gas and to cause the voltage regulator tube to conduct. Refer to the test data book for the proper use of the pushbuttons and for control settings.

c. Thyratrons. To test thyratrons, set the controls as indicated in the test data book. Press the proper pushbutton and adjust the BIAS control until the tube strikes; this is indicated by a glow between the tube elements and a sharp rise of the meter pointer. The limits of the bias voltage between which the tubes should strike are shown in the test data book. After the tube strikes, the condition of the tube is read on the meter.

d. Tuning Eye Tubes. Set the controls as indicated in the test data book. When the proper pushbutton is depressed, note the effect on the tuning eye and compare it to the data in the *Notations* column. When the eye is closed, a thin, bright line is observed; when the eye is open, a wide, dark area is observed.

25. Testing Subminiature Tubes

Subminiature tubes are tested in SUB. MIN. sockets X109 and X110 (fig. 9).

a. Subminiature tubes of the round type with short wire leads or pins are tested in special socket X110. This circular socket has eight contacts.

(1) Several basing arrangements (fig. 10) are used for these tubes. The arrows near several of the tube bases in figure 10 indicate the location of the dot on the base of the tube. Check the *Notations* column in the test data book; examine the tube and identify the basing. Use adapter E104 (par. 16*a*) when the subminiature tube has long leads.

(2) Insert the leads or pins in the corresponding contacts of socket X110. If the leads are long enough, set the POWER switch to the OFF position, grasp each lead about one-eighth inch from its end with the tips of a pair of long-nosed pliers, and insert the leads into the proper socket contacts. Set the POWER switch to the ON position and test the tube.

b. Subminiature tubes of the flat or in-line-contact type with pins or leads are tested in flat socket X109 (fig. 9). The tube pins or leads must be inserted so that the dot on the base of the tube is directly in line with the small, molded dot on the socket.

c. Subminiature tube types are identified in the test data book by a star beside the type number. The applicable basing for the various round types is indicated in the *Notations* column. The basing designation letter refers to the diagrams shown in figure 10.

Figure 9. Top view of sockets X109 (flat) and X110 (circular).

26. Stopping Procedure

a. Set the POWER switch to the OFF position.

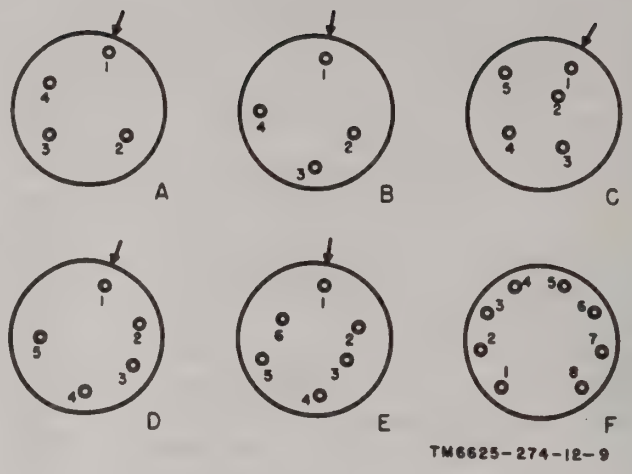

Figure 10. Basing diagrams for subminiature tubes (letters, A, B, C, D, E, and F identify basing for use with test data book).

b. Remove the tube under test from the test socket.

c. Place the adapters, if used, under the clamps on the inside of the cover.

d. Disconnect the ac line cord from the power source and wind it counterclockwise around the retainer bracket on the inside of the cover. Secure the plug under the storage clip (TV-7B/U and TV-7D/U, fig. 3 and 4), or under the coiled ac line cord (TV-7/U and TV-7A/U).

e. Place the test leads, if used, in the storage clips (not on TV-7/U). On the TV-7/U, store the test leads under the coiled ac line cord or as shown in figure 1.

f. Close the cover and secure the fasteners.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

27. General

The test set is designed for normal operation through a temperature range from —40° F to +125°F. The operation of the equipment may be more difficult in regions where extreme cold, heat, humidity, or moisture conditions prevail. Paragraphs 28 through 30 provide operational information that may be used to minimize the effects of regional extremes.

28. Operation at Low Temperatures

Subzero temperatures and climatic conditions associated with cold weather may effect the efficient operation of the test set.

a. Extreme cold makes the ac line cord and other rubber parts stiff and brittle. Handle the equipment carefully to avoid cracking the insulation on the ac line cord and on the test leads.

b. Keep the equipment in a warm, dry location. If possible, keep the test set in a heated enclosure. A standby heater is not provided; therefore, leave the test set turned on if possible.

c. Allow the test set to warm up for 10 to 15 minutes before testing tubes. The length of warmup time depends upon the temperature of the surrounding air.

d. If equipment that has been exposed to the cold is brought into a warm room, moisture will form on it and may cause fogging of the meter glass. Dry the equipment thoroughly.

e. Keep the cover of the test set closed at all times when the equipment is not in operation. This will prevent an accumulation of moisture within the equipment due to sweating.

29. Operation Under Tropical Conditions

Warm, damp climates expose the equipment to damage from moisture and fungus. The high relative humidity causes condensation when the temperature of the equipment drops below that of the surrounding air. Adequate ventilation will minimize this condition. Keep the cover of the test set closed as much as possible. Wipe all moisture and fungus from the exterior of the test set with a clean, lint-free cloth.

30. Operation in Desert Climates

Desert climates expose the test set to damage from dirt, dust, sand, and the effects of strong sunlight. Provide means for keeping dust and sand from entering the holes in the test sockets, adapters, and jacks, and from accumulating around the pushbuttons and other moving parts of the test set. Clean and dust the equipment frequently. When not in use, keep the cover closed to keep dust and dirt out of the exposed parts.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

31. General

The procedures in paragraphs 33 through 39 are to be performed by the operator or organizational maintenance personnel. Operator's maintenance consists of preventive maintenance (par. 33), visual inspection (par. 34), and replacement of electron tubes (par. 37) and lamps (par. 39). Organizational maintenance of the test set is limited to preventive maintenance (par. 33) and to the replacement of the adapters (fig. 8), knobs and pushbuttons, indicator light lens, cable clamps, and clip insulators. The only tools required are those tools normally available to the repairman-user because of his assigned mission.

32. Materials Required

The materials required for operator's and organizational maintenance are as follows:

a. Cleaning compound (Federal stock No. 7930-395-9542).

b. Cleaning cloth.

c. Sandpaper, #0000.

33. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 11 and 12) is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items not applicable to the test set are lined out in figure 12. References in the ITEM block in figure 12 are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the form.

b. Items. The information shown below supplements DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the case, the front panel, and the adapters. If necessary, wet a cloth with cleaning compound and then wipe the parts with a dry, clean cloth.
2	Inspect the clips that hold the adapters and the clips that hold the test leads (TV-7B/U and TV-7D/U) for tight spring action. Check the ring binder for proper operation. Check the PILOT, FUSE, and SHORTS lamps for broken glass. Check to see that the socket-saver adapters (fig. 7) are tightly secured in their respective test sockets.

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.**

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE: TEST SET, ELECTRON TUBE TV-7D/U

EQUIPMENT SERIAL NUMBER: 2404

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/Chief for 1st echelon, or the Inspector for higher echelons
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		8 FEB '60	Harold Andrews
	✓	22 FEB '60	James Drake

4

DA FORM 1 MAY 57 11-266

TM6625-274-12-10

Figure 11. DA Form 11-266, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF FEBRUARY 1960

NO.	DAILY ITEM	1 HA 17	2 HA 18	3 HA 19	4 HA 20	5 HA 21	6 HA 22	7 HA 23	8 HA 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, ~~CASES, CABINETS, CONTROL PANELS, INTER-CONNECTING PLUGS~~, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PAR. 31b	✓	✓	✓	✓	✓	✓	✓	✓									✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, ~~CONNECTORS~~ AND PILOT LIGHTS. PAR. 31b	✓	✓	✓	✓	✓	(X)	✓	✓									✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS.	✓	✓	✓	✓	✓	✓	✓	✓									✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓									✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE ~~AND SHOCK-MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PAR. 9d	✓					✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS~~, FUSES, ~~CONNECTORS, PLUG-IN COILS~~, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. ~~INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREW TYPE TERMINALS OF TRANSFORMERS~~, FIXED CAPACITORS, RESISTORS, ~~SWITCHES~~, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES~~; CLEAN INTERIOR OF CHASSIS ~~AND CABINETS~~.	✓
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. METER GLASS BROKEN.
REPORTED TO HIGHER ECHELON
MAINTENANCE FOR REPLACEMENT.

2 3

Figure 12. DA Form 11-266, pages 2 and 3.

34. Visual Inspection

a. When the equipment fails to perform properly, check the items listed below.

(1) Test leads, if used, poorly connected or improperly connected.
(2) Incorrect pushbutton depressed.
(3) Improper setting of selector switches or controls (par. 18*b*(3)).
(4) Battery or resistors improperly connected (par. 24*a*).
(5) FUSE lamp defective.
(6) LINE ADJUST control improperly adjusted (par. 17*c*).

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (par. 35).

35. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the operator or the organizational maintenance man can perform are given in the *Corrective measures* column. When using the checklist, start at step 1 and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken. Perform the steps in *b* below.

b. Checklist.

	Step	Item	Action or condition	Normal indication	Corrective measures
PREPARATORY	1	Ac line cord.	Connect ac line cord to power source.		
	2	POWER switch.	Set switch to ON position.	PILOT lamp lights.	Check ac line cord connection. Remove (par. 39*a*) and check (par. 23) PILOT lamp; replace if defective. Remove (par. 39*a*) and check (par. 23) FUSE lamp; replace if defective. Higher echelon repair required.
	3	Meter.		Pointer stays at zero.	Defective type 86 tube; replace tube (par. 37) .
	4	Pushbutton 1—LINE ADJ.	Depress pushbutton.	Meter pointer moves up-scale.	Higher echelon repair required.
	5	LINE ADJUST control knob.	Rotate control knob, while holding pushbutton 1—LINE ADJ. down, until meter pointer is directly over LINE TEST mark.	Meter pointer moves when control knob is turned.	Check for low-line voltage if pointer will not adjust properly. Higher echelon repair required.
	6	Selectors.	Set selectors as directed in paragraph 17*e*(1).	Selector knobs should be tight and point directly at a number or letter. The switch detents should be positive.	When a selector pointer is between two numbers or two letters, rotate switch fully counterclockwise. Loosen knob setscrew, turn knob until it points directly at the first number or letter, and tighten setscrew. Tighten loose knobs. If switch detents are not positive, higher echelon repair is required.
	7	FUNCTION SWITCH.	Rotate switch through the five SHORTS positions.	SHORTS lamp glows at positions 2 and 3 of switch.	Check switch settings. Replace SHORTS lamp (par. 39*b*). Higher echelon repair required.
	8	POWER switch.	Set switch to OFF position.	PILOT lamp goes out.	

	Step	Item	Action or condition	Normal indication	Corrective measures
START	9	Selectors and controls.	Set according to test being performed.		
	10	Tube under test.	Insert in proper test socket. Make connections as required.	Tube pins enter test socket without forcing.	Check for bent pins. Straighten pins of miniature tubes in one of the pin straighteners.
	11	POWER switch.	Set switch to ON position.	PILOT lamp lights.	
EQUIPMENT PERFORMANCE	12	Meter.	Checking tube for dynamic mutual conductance, emission, or gas.	Meter pointer indicates condition of tube under test when proper pushbutton is depressed.	If meter pointer stays at zero, tube under test may be defective. Check setting of selectors and controls. Test another tube. Higher echelon repair required.
	13	BIAS control.	Gas test.	Meter pointer can be adjusted to 10 by turning control knob.	Adjust BIAS control knob until pointer indicates 100, then proceed with gas test.
	14	Panel lamp test socket.	Checking a panel (pilot) lamp (par. 23).	A good lamp will light.	Make good contact between lamp and test socket. Check control settings. Lamp may be defective; check other lamps if available. Higher echelon repair required.
	15	Adapter E104 (fig. 8).	Testing long lead subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Unsnap locking device on adapter, move tube up and down to check seating of leads, and secure locking device. Test tube again. Check control settings. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Replace adapter and check tube again. If meter pointer does not move when correct pushbutton is depressed, test another tube. Higher echelon repair required.
	16	Adapter E105 (fig. 8).	Testing tube type 3E29, 829-B, or 832-A.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of adapter and tube. Check plate lead for a good connection. Check setting of controls. Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	17	Adapter E107 (fig. 8).	Testing tube type 2C39.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of tube and adapter. Remove adapter and tube and squeeze spring contacts closer together if necessary. Check setting of controls. Replace adapter and tube in test socket and test tube again.

	Step	Item	Action or condition	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE					Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	18	Socket X109 (fig. 9).	Testing flat subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Check to see that dot on base of tube is aligned with dot on test socket. Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Test another tube. Higher echelon repair required.
	19	Socket X110 (fig. 9).	Testing round subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Test another tube. Higher echelon repair required.
STOP	20	Tube under test.	Remove from test socket.		
	21	POWER switch.	Set to OFF position.	PILOT lamp goes out.	
	22	Ac line cord.	Remove ac line cord plug from power source.		

36. Removal of Chassis

a. Removal.

(1) Unsnap the latches and open the cover of the test set.

(2) Unwind the ac line cord from the retainer bracket and remove the cover from the test set. Remove the cover by sliding it to one side until the hinge pins are disengaged.

(3) Remove the screws that secure the front panel to the case.

(4) Hold the front panel to the case, turn the test set over, and gently place it on a clean, flat surface.

(5) Slowly lift the test set case upward until it is clear of the chassis.

b. Replacement.

(1) Position the test set case so that the handle is forward.

(2) Carefully lower the test set into the case. Be sure that no wires are caught between the front panel and the edge of the case.

(3) Replace the screws that secure the front panel to the case. Tighten the screws in rotation a little at a time to prevent binding.

(4) Replace the cover on the case, wind the ac line cord counterclockwise on the retainer bracket, secure the plug under the clip (not on TV-7/U), close the cover, and secure the latches.

37. Tube Replacement

When trouble occurs, check the ac line cord connection and the control settings before removing any tubes. If tube failure is suspected, use the tube substitution method (*a* below) to check the tubes.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.**

a. Tube Substitution Method. Replace a suspected tube (*b* below) with a new tube. If the equipment still does not work, remove the new tube and put back the original tube. Repeat this procedure with the other tube. If the test set is still inoperative, other checks are required (par. 35*b*).

b. Replacing Tubes in Test Set, Electron Tube TV-7(*)/U. Check the tubes in the test set as follows:

(1) Remove the chassis from the case (par. 36*a*).

(2) Remove the tube clamp (fig. 13) from the threaded stud and remove the tube.

Caution: **Be careful not to hit the meter case with tube type 83 when removing the tube.**

(3) Replace the tube (*a* above) with one of the running spares.

(4) Set the tube (or a replacement) in the socket and secure it with the tube clamp.

(5) Replace the chassis in the case (par. 36*b*).

38. Preferred-Type Tubes

A preferred-type electron tube, type 5Y3WGTA, has been developed as a direct replacement for nonpreferred types 5Y3GT and 5Y3WGT (par. 7). The 5Y3WGTA is used in the power supply. When replacement of a 5Y3GT or a 5Y3WGT is necessary, replace it with a 5Y3WGTA. Do not substitute a 5Y3GT or a 5Y3WGT for a 5Y3WGTA.

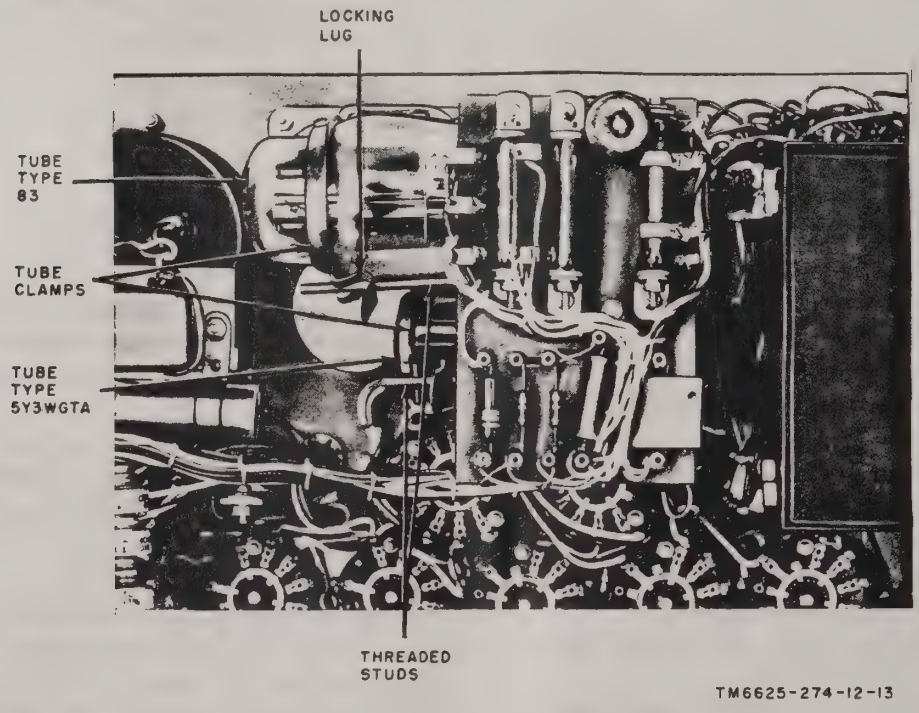

Figure 13. Tube location.

39. Replacement of Lamps

The FUSE, PILOT, and SHORTS lamps are removable from the front panel of the test set.

a. The FUSE lamp and PILOT lamp have bayonet-type bases. Unscrew and remove the PILOT lamp indicator jewel to gain access to the PILOT lamp. To remove either lamp, press downward, turn the lamp to the left, and lift straight up. To replace the FUSE or PILOT

lamp, insert the lamp in the appropriate socket, press downward, turn the lamp to the right, and release it. Replace the PILOT lamp indicator jewel.

b. The SHORTS lamp has a screw-type base. Remove the lamp by turning it to the left; replace the lamp by turning it to the right.

CHAPTER 4
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

40. Removal From Service

a. Set the POWER switch to the OFF position and disconnect the test set from the power source.

b. Place the adapters under the clamps on the cover.

c. Wind the ac line cord counterclockwise around the retainer bracket and place the plug under the clip (not on TV-7/U). Place the test leads under the coiled ac line cord (TV-7/U and TV-7A/U) or as shown in figures 1 and 2. On the TV-7B/U and the TV-7D/U, insert one end of the test leads into the storage clips and connect the alligator clips to the studs (fig. 3 and 4).

d. Close the cover and secure it with the latches.

41. Repackaging for Shipment or Limited Storage

(fig. 14)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 8) will also be helpful.

a. Material Requirements. The following materials are required for repackaging Test Set, Electron Tube TV-7(*)/U. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Flexible corrugated fiberboard	10 sq ft
Waterproof wrapping paper	10 sq ft
Gummed paper tape	3 ft
Pressure-sensitive tape	4 ft
Metal strapping (⅝- by 0.020-inch) (*Note.* Strapping seals required)	8 ft
Wooden box (inside dimensions: 18⅜ by 10¼-by 7⅞-inch)	1 ea (9 bd ft)

b. Packaging.

(1) *Technical manual.* Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the seams with pressure-sensitive tape.

(2) *Spare parts.* Wrap each part within a layer of flexible corrugated fiberboard. Seal the seams with gummed paper tape. Overwrap the flexible corrugated fiberboard with waterproof wrapping paper and seal with pressure-sensitive tape.

(3) *Test set.* The procedure used to package the test set is the same as the procedure used to package the spare parts ((2) above).

c. Packing.

(1) Fabricate a wooden box.

(2) Place the packaged test set (*b*(3) above) in the wooden box.

(3) Place the spare parts (*b*(2) above) and the technical manuals on top of the test set.

(4) Nail down the wooden cover.

(5) Strap the wooden box when intertheater shipment is involved.

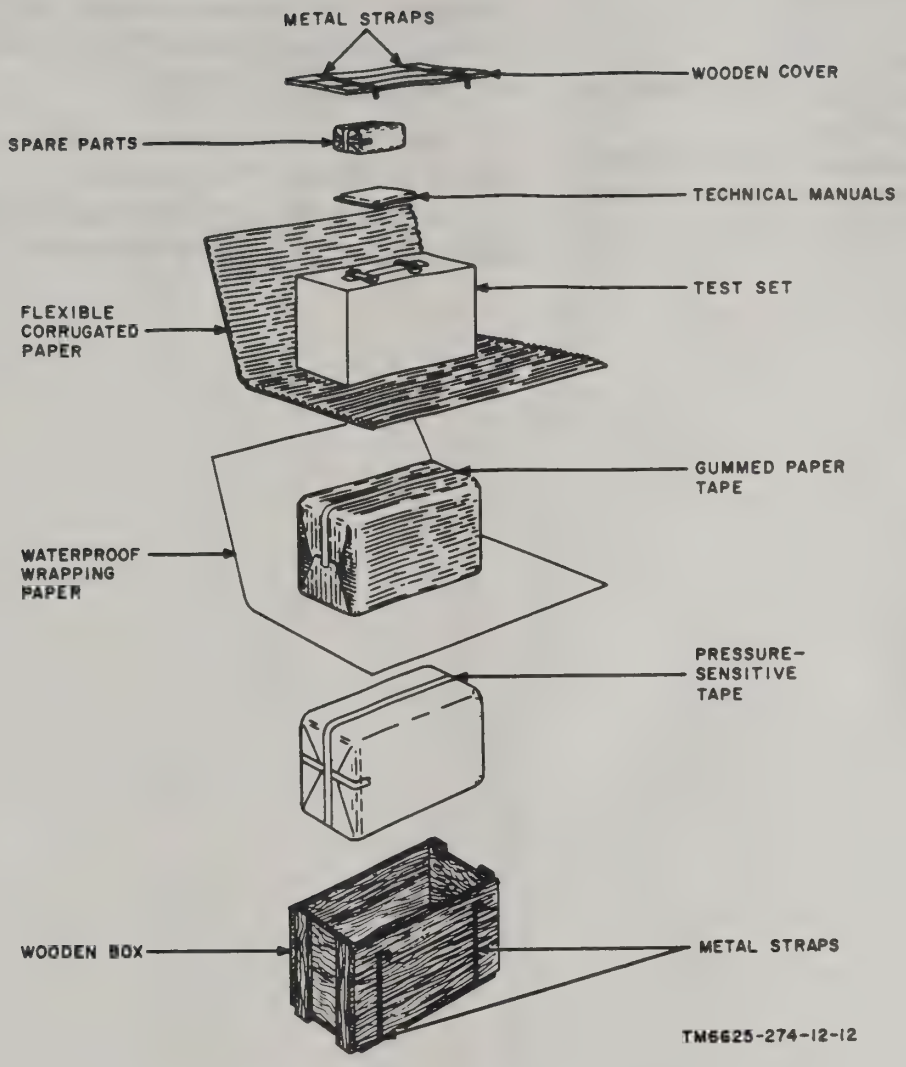

Figure 14. Field repackaging diagram.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

42. Authority for Demolition

The destruction procedures outlined in paragraph 43 will be used to prevent further use of the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

43. Methods of Destruction

Any or all of the methods of destruction given below may be used.

a. Smash. Use sledges, axes, hammers, crowbars, or any other heavy tools available; smash the case, cover, adapters, front panel, and meter.

b. Cut. Use axes, handaxes, machetes, or knives; cut the ac line cord and test leads.

c. Burn. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades; burn the technical manuals and test data book.

Warning: **Be extremely careful with explosive and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use grenades, TNT, or firearms, if explosives are necessary.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways.

APPENDIX I
REFERENCES

Following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U:

SB 38-100	Preservation, Packaging and Packing Materials, Supplies and Equipment Used by the Army
TB 11-5083-1	Tube Test Data for Electron Tube Test Sets TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U

APPENDIX II
OPERATOR'S MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope

a. General. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part* of the major item, and all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns. The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* A dagger (†) indicates the model in which the part is used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustrations (Figure No.).* The numbers in this column refer to the illustration or illustrations where the part is shown.

(9) *Illustrations (Item No.).* This column lists the reference symbols used for identification of items in the illustrations or text of the manual.

2. Critical Items

A zero slash (0) in the "Description" column indicates items that are expected to fail during the first year; also items that will make the equipment inoperative if they fail.

Section II. FIRST ECHELON FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL 1	2	3	4	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(9) ILLUSTRATIONS ITEM NO.
						ITEMS COMPRISING AN OPERABLE EQUIPMENT					
						TEST SET, ELECTRON TUBE TV-7/U; TV-7/A,B,D/U					
						NOTE: Model Column 1 refers to TV-7/U; Column 2 refers to TV-7A/U; Column 3 refers to TV-7B/U; Column 4 refers to TV-7D/U					
	6625-376-4939					TEST SET, ELECTRON TV-7/U; TV-7A,B,D/U:	ea	NX		1,2,3,4	
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM 11-6625-274-12P:	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL BULLETIN TB-11-5033-1	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM11-5003	ea	X	2		
	5935-204-8379	†	†	†	†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-B-179212	ea	X	1	8	E104
	5935-201-8500	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-33	ea	X	1	8	E105
	5935-537-4056		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-C-179260	ea	X	1	8	E105
	5935-502-1777	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-50	ea	X	1	8	E107
	5935-511-6491		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-B-179230	ea	X	1	8	E107
	6625-684-1189	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X3B	ea	X	1	4	X3B
	6625-618-9928	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X7B	ea	X	1	4	X7B
	6625-618-9929	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X10B	ea	X	1	4	X10B
	6625-586-8349			†		COVER, TEST SET: Hickok part No. 3145-333	ea	X	1	3	
	6625-668-4683	†	†	†	†	LEAD, TEST: Hickok part No. 12450-245	ea	X	2	1,2,3,4	W101 W102
						RUNNING SPARES AND ACCESSORY ITEMS					
						TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U					
	5960-262-0218	†	†	†	†	∅ ELECTRON TUBE: MIL type 5Y3WGTA	ea	X	1	15	V102
	5960-100-7323	†	†	†	†	∅ ELECTRON TUBE: MIL type 83	ea	X	1	15	V101
	6240-179-1814	†	†	†	†	∅ LAMP, GLOW: GE part No. NE-45	ea	X	1	15	E101
	6240-014-2306	†	†	†	†	∅ LAMP, INCANDESCENT: GE part No. 81	ea	X	1	15	E103
	6240-155-8706	†	†	†	†	∅ LAMP, INCANDESCENT: GE part No. 47	ea	X	1	15	E102

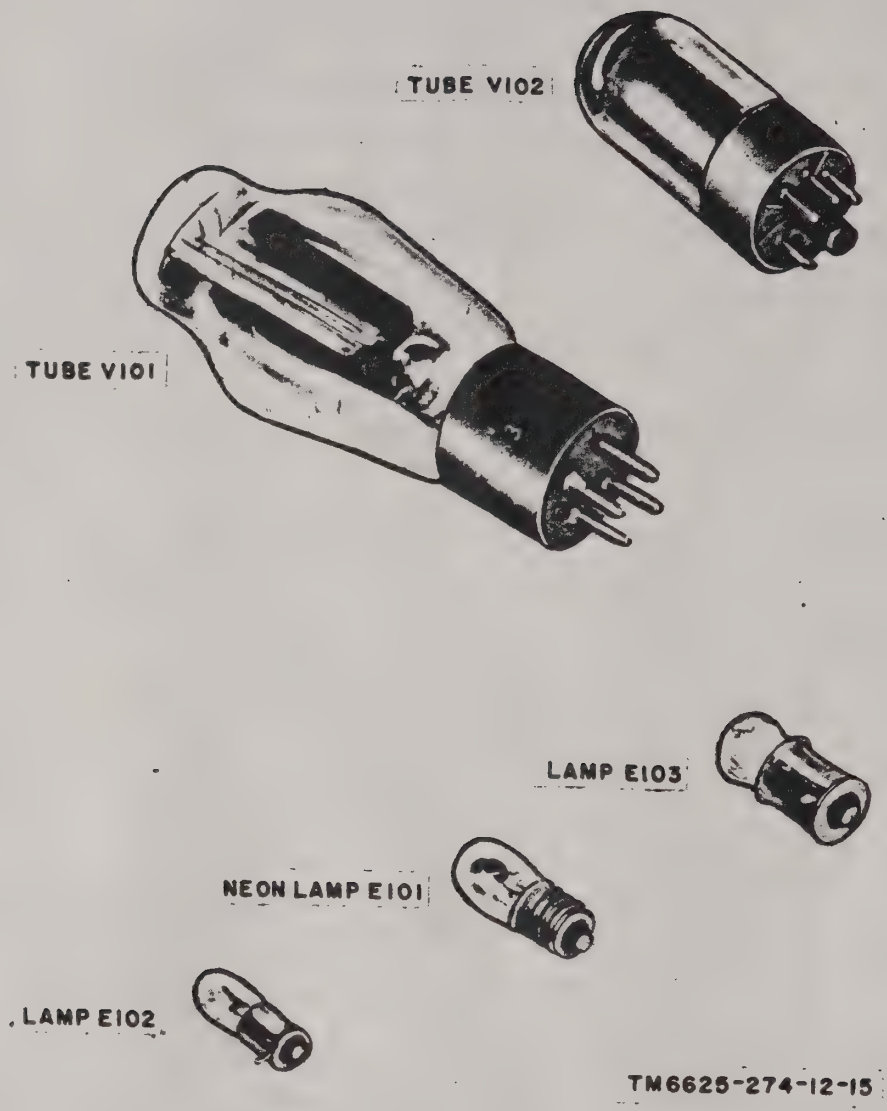

Figure 15. Electron tubes and lamps.

APPENDIX III
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. Scope

a. General. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Allocation of Maintenance Functions. Columns in section II, Allocation of Maintenance Functions, are defined as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(h) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation. Column 5 is not used.

(4) *Tools required.* This column indicates the tool, test, and maintenance equipments required to perform the maintenance functions. These numbers are identified in section III, Allocation of Tools for Maintenance Functions.

(5) *Remarks.* This column contains any notations necessary to clarify the data cited in the preceding columns.

c. Allocation of Tools for Maintenance Functions. Columns in section III, Allocation of Tools for Maintenance Functions, are as follows:

(1) *Tools required for maintenance functions.* This column lists the tools and test equipment required to perform the maintenance functions.

(2) *1st, 2nd, 3rd, 4th, and 5th echelon.* A dagger (†) in columns 3, 5, and 6 indicates that the tool or test equipment is allocated to that echelon. Columns 2 and 4 are not used.

(3) *Tool code.* This column lists the tool code assigned. The numbers are used

in the maintenance allocation chart to refer to the indicated item.

(4) *Remarks.* Not used.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, and clamps.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	
ADAPTER, TUBE SOCKET	replace		X					
	repair				X			
BINDER, LOOSE LEAF	replace				X			
BUTTON, PUSH	replace				X		5	
BUMPER, RUBBER	replace				X			
INSULATOR, CLIP	replace		X					
CABLE, POWER, ELECTRICAL	replace				X			
CAPACITOR	replace				X		5	
CASE (2) ELECTRICAL EQUIP CABINET	replace					X	5	
	repair					X	5	
CATCH, LUGGAGE	replace				X		5	
HANDLE, LUGGAGE	replace				X		5	
CLAMP, ELECTRICAL	replace		X					
CONNECTOR	replace				X		5	
DIAL CONTROL	replace				X			
	repair				X			
ELECTRON TUBE	replace	X						

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TV-7/U; TV-7A,B,D/U (continued)								
GASKET, RUBBER	replace				X		5	
	rebuild					X	5	
GROMMET, RUBBER	replace				X		5	
HINGE, BUTT	replace				X		5	
KNOB	replace		X					
LAMP, GLOW	replace	X						
LAMP, INCANDESCENT	replace	X						
LAMPHOLDER	replace				X		5	
LIGHT INDICATOR	replace				X		5	
LENS, INDICATOR LIGHT	replace		X					
LEAD, TEST	replace				X			
	rebuild				X		5	
CLIP, ELECTRICAL	replace				X		5	
JACK, TIP	replace				X		5	
METER, ELECTRON TUBE TESTER	replace				X		5	
	repair					X	5	
RECTIFIER, METALLIC	replace				X		5	
RESISTOR	replace				X		5	
RETAINER, ELECTRON TUBE	replace				X		5	
SOCKET, ELECTRON TUBE	replace				X		5	
STRAIGHTENER, PIN	replace					X		
STUD, THREADED	replace				X			
SWITCH	replace				X		5	
TERMINAL, STUD	replace				X		5	
TRANSFORMER, POWER	replace				X		5	

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH	(5) 4TH ECH	(6) 5TH ECH	(7) TOOL CODE	(8) REMARKS
TV-7/U; TV-7A, B, D/U							
MULTIMETER TS-352/U				†	†	1	
RESISTOR, DECADE ZM-16/U				†	†	2	
TEST SET, ELECTRON TUBE TV-7/U				†		3	
TEST SET, ELECTRON TUBE TV-2/U					†	4	
TOOL EQUIPMENT TE-113				†	†	5	
TRANSFORMER, VARIABLE CN-16/U				†	†	6	
VOLTMETER, METER ME-30/U				†	†	7	
TOOL AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				8	

By Order of *Wilber M. Brucker*, Secretary of the Army:

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Chief of Staff.

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USA Abn & Elct Bd (1)
USA ATB (1)
US ARADCOM (2)
US ARADCOM Rgn (2)
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55–500 (AA-AE)
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NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.

USAR: None

For explanation of abbreviations used, see AR 320–50.

EB5AGV's TV-7 Voltage Alignment Instructions

Keep them glowing!

This procedure was developed from some notes ***Dan Nelson***, the TV-7 expert, sent me some time ago in order to align my TV-7C/U. I sorted all the info I got in an easy-to-follow way... I hope you can use it to get your TV-7s to specs!. Any questions will be welcomed. As usual, **BEWARE WITH HIGH VOLTAGES PRESENT IN THE UNIT**. Don't do it if you are not confident.

VOLTAGE ALIGNMENT IN A TV-7 TESTER

STANDARD CONDITIONS:

-Settings: **HS5-3460**
-Plate load: 375K resistor between pins 3 and 6 in octal socket (plate load).

FILAMENT and PLATE adjust

- (1) Put the filament voltage in the .6 volts position and set the line for .652 VAC on the filament with no load (measure voltage between pins 2 and 7 in octal socket).
- (2) Place the filament voltage on 10 volts and measure 10.04 VAC
- (3) Place the filament voltage on 117 volts and measure 117 VAC
- (4) Arbitrate the above to the best setting for all.
- (5) This should produce a LINE SET condition. Adjust the line set to agree, by means of a calibration pot on the bracket hanging off the function switch, R134 (this is only present in TV-7D/U units. Check LINE SET resistors in any other model and replace them if out of tolerance, to get the right meter deflection).
- (6) Final Check, for most TV-7 units, the actual PLATE DC voltage will then be 153-154 VDC (measure voltage between pins 3 and 6 in octal socket).

GRID, LO SCREEN and HI SCREEN adjust

- (7) Then, if the plate voltages and the filament voltages resolve themselves, the rest can be worked out by fixing the tap setting on the resistor on the terminal board by the transformer.

  The taps in R130 control GRID, LO SCREEN and HI SCREEN voltages.

  It is important to adjust the various voltages in the proper order as they interact otherwise. First do the GRID voltage, then the LO SCREEN voltage, then the HI SCREEN voltage. All of these can only be done after the LINE SET has been negotiated and can be used as a reference. Voltmeter is assumed to block AC and read only DC. 375K resistor is between cathode and plate. The Voltmeter must be arranged between the electrodes involved in the setup. Thus for a setting of HS5-3460

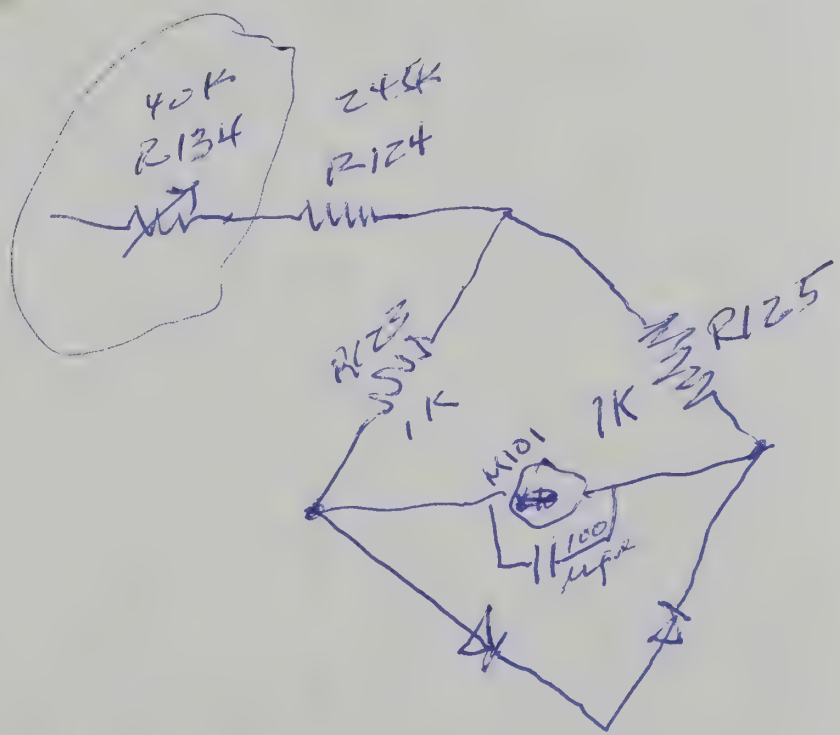
  - PLATE Volts measured in octal socket: '-' Pin 6 , '+' Pin 3

- GRID Volts measured in octal socket: '-' Pin 6 , '+' Pin 5 (negative values)
- SCREEN Volts measured in octal socket: '-' Pin 6 , '+' Pin 4

- (8) GRID adjustment: Turn up the grid control all the way, to 100. Then adjust tap interior most to produce -40.0+-2 VDC. A second check should be made with the dial set at exactly 22. The grid volts should be -3.0+-.2 VDC. Play with the tap so that the spread is best.
- (9) LO SCREEN adjustment: Set the bias dial to zero. Set the voltmeter for the SCREEN voltage. To adjust the LO SCREEN voltage to 56.0+-1 VDC, adjust the next tap from the one used to adjust the GRID. Measure by pressing button 2+3 at the same time.
- (10)HI SCREEN adjustment: Set the bias dial to zero. Set the voltmeter for the SCREEN voltage. Adjust the tap nearest the end of the R130 resistor (only in TV-7D/U). If there is none, insure that the voltage is 130+-3 VDC when you press button 3.

And that's all!. Now you should have a voltage calibrated TV-7. Next step is to calibrate the transconductance (gm) readings. I'll post this method as soon as possible... stay tuned!.

Go back to TV-7 Page



WARNING

Be careful not to contact high-voltage connections or the 115-volt ac input connections when replacing tubes in the test set. Voltages up to 300 volts ac may be encountered in this equipment. Serious injury or death may result from contact with these connections.

DON'T TAKE CHANCES!

		0480						

General Notes
Disregard shorts test after GM test is completed. Allow 60 seconds for heater warmup. Allow 5 seconds to obtain Gm readings.
(1) Hold down pushbutton 2-diode and press pushbutton 3-mut. cond.

- **TB 11-6625-274-12/1 Changes No.3, 2 June 1966**
  This change supersedes C1, 31 May 1962, and C2, 31 January 1964 TB 11-6625-274-12/1, 17 January 1962, is changed with the following additions

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U - 2 June 1966

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
2C39	6.3	HS6-5080	18		E	3	50	TV-7/U,TV-7A/U, TV-7B/U only
2C39	6.3	HS6-5080	78	0	F	3	50	Use adapter E107. TV-7D/U only
2C40	6.3	HS0-0080	17		C	3	35	Cap connects to plate. Ring connects to grid
2C42	6.3	HS0-0080	10		D	3	38	Cap connects to plate. Ring connects to grid
2C43	6.3	HS0-0080	17		C	3	56	Cap connects to plate. Ring connects to grid
2C45	7.5	ER3-2000	37		B	3	55	
2C46	6.3	HS0-0080	9		B	3	24	Cap connects to plate. Ring connects to grid
2C50	12.6	HY1-2030	41		B	3	45	Triode No. 1
2C50	12.6	HY4-5060	41		B	3	45	Triode No. 2
2C51	6.3	KR7-6082	17		D	3	26	Triode No. 1
2C51	6.3	KR3-4028	17		D	3	26	Triode No. 2
2C52	12.6	HY4-5062	15		B	3	25	Triode No. 1
2C52	12.6	HY1-2035	15		B	3	25	Triode No. 2
2C53	6.3	HS5-0080	0		B	3	10	Cap connects to plate
2CW4	2.0	DR4-2080	16		D	3	44	Use Hickok adapter 1050-127
		ET1-						#Hold down pushbutton 2-DIODE and press

2CY5	2.5	5620	11		D	#	25	pushbutton 3-MUT.COND.
2D21	6.3	ET1-6025	#	90	A	4	40	#Should strike between settings 40 and 30 of the BIAS dial
2EA5	2.5	ET1-5620	10		D	3	26	
2EN5	2.0	ET0-7056	0	55	A	2	30	Diode No.1
2EN5	2.0	ET0-2056	0		D	3	49	Diode No.2
2ER5	2.0	ET2-5670	10		D	3	49	
2E5	2.5	GR5-4030	0	100	A	3		Eye open
2E5	2.5	GR5-4230	0	100	A	3		Eye closed
2E22	6.3	FR3-0240	0		C	3	50	Caps connects to plate
2E24	6.3	HS5-0300	35		C	3	40	Caps connects to plate. Short on 3
2E25	6.3	HS5-0408	0		C	3	88	Caps connects to plate
2E26	6.3	HS5-0318	37		C	3	44	Caps connects to plate
2E30	6.3	ET1-5602	20		C	3	88	
2E31	1.1	DV4-1200	0		B	#	10	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E32	1.1	DV4-1200	0		B	#	10	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E35	1.1	DV4-1200	18		B	#	15	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E36	1.1	DV4-1200	18		B	#	15	#Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E41	1.1	EW5-1200	20		B	#	10	Pentode section. #Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E41	1.1	EW0-3000	0	0	A	2	5	Diode section
2E42	1.1	EW5-1200	20		B	#	10	Pentode section. #Hold down pushbutton 2-DIODE and press pushbutton 3-MUT.COND.
2E42	1.1	EW0-3000	0	0	A	2	5	Diode section
2ES5	2.5	ET2-5010	12		D	3	35	
2EV5	2.5	ET1-5620	10		D	3	43	
2FH5	2.5	ET2-5070	13		D	3	40	
2FQ5	2.5	ET2-5070	15		D	3	42	
2FS5	2.5	ET1-	10		D	3	30	

		5670						
2FY5	2.5	ET2-5016	14		D	3	50	
2G21	1.1	EX3-2651	53	0	A	4	20	Heptode sect.
2G21	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2G22	1.1	EX3-2651	53	0	A	4	20	Heptode sect.
2G22	1.1	EX3-1000	50	0	A	4	40	Triode sect.
2GK5	2.5	ET2-5076	30		C	3	38	
2T4	2.5	ET2-1050	37		D	3	25	
2V2	2.5	HS0-0050	0	45	A	4	40	Cap connects to plate. Short on 3
2V3	2.5	HS0-0000	0	68	A	4	40	Cap connects to plate
2W3	2.5	JS0-4000	0	0	A	7	40	
2X2A	2.5	ER0-0000	0	78	A	4	40	Cap connects to plate. Short on 3
2Z2	2.5	ER0-2000	0	0	A	7	34	

TABLE UNDER CONSTRUCTION!. Keep tuned for upgrades.

- **T.O. 33AA21-5-31C, 15 January 1965**: This Technical Order supplements T.O. 33AA21-5-31 dated 17 January 1962

TEST DATA FOR ELECTRON TUBE TEST SETS TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U - 15 January 1965

Tube type	Filament	Selectors	Bias	Shunt	Range	Press	Minimum value	Notations
6293	6.3	HS5-0310	25		D	3	36	
6540	6.3	DU7-1265	10		D	3	22	
6850	12.6	FT6-0140	22		C	3	56	Cap above octal pins 2 and 3 connects to plate. Use Hickok adapter 1050-107. Connect negative end of a 30 V battery to pin 2 of the Loctal socket. Connect positive end of the 30 V battery to pin 4 of the Loctal socket
6850	12.6	FT2-0140	22		C	3	56	Cap above octal pins 6 and 7 connects to plate. Connect negative end of a 30 V battery to pin 6 of the Loctal socket. Connect positive end of the 30 V battery to pin 4 of the Loctal socket. ***

Changes in force: C 2, C 4, and C 5

TM 11–6625–274–12
C 5

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *30 April 1974*

Operator's and Organizational Maintenance Manual
TEST SETS, ELECTRON TUBE TV–7/U, TV–7A/U, TV–7B/U AND TV–7D/U

TM 11–6625–274–12, 14 June 1960, is changed as follows:

Page 7. Delete paragraph 1.1 and substitute:

1.1. Indexes of Publications. *a. DA Pam 310–4.* Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310–7. Refer to DA Pam 310–7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 2. Delete paragraph 2 and substitute:

2. Forms and Records. *a. Reports of Maintenance and Unsatisfactory Equipment.* Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38–750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (report of Packaging and Handling Deficiencies) as prescribed in AR 700–58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71–4 (Air Force)/MCO P4030.29 (Marine Corps), and DSAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55–38(Army)/NAVSUPINST 4610.33/AFM 75–18/MCO P4610.19A (Marine Corps), and DSAR 4500.15.

2.1. Reporting of Errors. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL–MA–C, Fort Monmouth, NJ 07703.

Add paragraph 5.1 after paragraph 5.

5.1. Items Comprising an Operable Equipment

FSN	*QTY*	*Nomenclature, part No., and mfr code*	*Usable on code*	*Fig. No.*
6625–376–4939		Test Set, Electron Tube TV–7/U, TV–7A,B/U: dynamic mutual conductance type; 0.6 to 117 V fil voltage range meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125 V, 50 to 1000 Hz single phase; SW positions A thru E; portable type		1,2,3
6625–820–0064		Test Set, Electron Tube TV–7D/U: dynamic mutual conductance type; 0.6 to 117 V fil voltage range; meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125 V, 50 to 1000 Hz single phase; SW position A thru F, portable type consisting of:		

NOTE

The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708–42 and used to identify manufacturer, distributor, or Government agency, etc.

NOTE

In usable on code column, number 1 refers to TV–7/U; number 2 refers to TV–7A/U; number 3 refers to TV–7B/U; number 4 refers to TV–7D/U.

FSN	QTY	Nomenclature, part No., and mfr code	Usable on code	Fig. No.
5935–732–1919	1	Adapter, Electron Tube Socket: SM–B–425536; 80063	1,2,3,4	8
5935–537–4056	1	Adapter, Electron Tube Socket: SM–C–179260; 80063	1,2,3,4	8
5935–305–1189	1	Adapter, Electron Tube Socket: SM–B–425538; 80063	1,2,3,4	8
6625–684–1189	1	Adapter, Test: SM–B–425638; 80063	1,2,3,4	4
6625–618–9928	1	Adapter, Test: SM–B–425639; 80063	1,2,3,4	4
6625–618–9929	1	Adapter, Test: SM–B–425640; 80063	1,2,3,4	4
6625–808–1802	1	Adapter, Electronic Tube Socket: nuvistor tube socket adapter; 1050–127; 28569	1,2,3,4	
6625–069–1960	1	Adapter, Test: socket for GE Micro-Miniature 7077 and 7486; 86–060; 04435	1,2,3,4	
6625–668–4683	2	Lead, Test: SM–B–425548; 80063	1,2,3	15
6625–727–7065	2	Lead, Test: SM–B–45548; 80063	4	15

Page 34. Appendix II is deleted.

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Ft Richardson (ECOM Ofc) (2)

Units org under fol TOE: 1 ea.

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ARNG: State AG (3); Units—Same as Active Army.

USAR: None.

For explanation of abbreviations used, see AR 310–50.

U.S. GOVERNMENT PRINTING OFFICE: 1974—540–860/3590A
611–046

*TM 11-6625-274-12
C 4

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *22 June 1966*

Operator's And Organizational Maintenance Manual

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, And TV-7D/U

TM 11-6625-274-12, 14 June 1960, is changed as follows:

Note. The parenthetical reference to previous changes (example: "page 1 of C 2") indicates that pertinent material was published in that change.

Page 7, paragraph 1.1 (as changed by C 3, 18 May 64) line 6 after "Technical Bulletins," add Supply Manuals (Types 4, 6, 7, 8, and 9.)

Paragraph 2 (page 1 of C 2, 30 Jan. 63). Delete and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipments. Fill out and forward DA Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700-58 (Army) NAVSANDA Publications 378 (Navy) and AFR 71-4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Publications) will be used for reporting these improvements. This form will be completed using pencil, pen or typewriter and forwarded direct to Command, ATTN: AMSEL - MR - NMP - AD

paragraph 18*c* (1), Note. Delete the note.

Page 17, (as changed by C 3, 18 May 64) paragraph 18*c* (1), Note. Delte the note.

Page 18, paragraph 21*d*, note.

Note (as changed by C 3, 18 May 64). If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob to full scale (100 on dial).

Page 33, appendix I, (as changed by C 3, 18 May 64).

Delete and substitute.

APPENDIX I

REFERENCES

The following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U.

DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, (types, 3, 6, 7, 8 and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.	SB-38-100	Preservation Packaging

*This change supersedes C 3, 18 May 1961.

	and Packing Materials, Supplies and Equipment Used by the Army.	Maintenance Repair Parts And Special Tool Lists, Test sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, And TV-7D/U.
TM 38-750	Army Equipment Record Procedures.	
TM 11-6625-274 25P	Organizational, DS, GS, and Depot	

Page 34, appendix II, delete and substitute:

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

Columns are as follows:

a. Federal Stock Number. This column lists the 11-digit Federal stock number.

b. Designation by Model. The dagger (†) indicates model in which the part is used.

c. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

d. Unit of issue. The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

e. Expendability. Nonexpendable items are indicated by NX. Expendable items are not annotated.

f. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spare Items" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

g. Illustration. The "Item No." column lists the reference designations that appear on the part in the equipment. These same designations are also used on any illustrations of the equipment. The numbers in the "Figure No." column refer to the illustrations where the part is shown.

SECTION II. OPERATOR'S FUNCTIONAL PARTS LIST

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL					DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
										FIGURE NO.	ITEM NO.
						TEST SET, ELECTRON TUBE TV-7/U; TV-7A/U; TV-7B/U; and TV-7D/U					
						NOTE: Model column 1 refers to TV-7/U; column 2 refers to TV-7A/U; column 3 refers to TV-7B/U; column 4 refers to TV-7D/U					
						ITEMS COMPRISING AN OPERABLE EQUIPMENT					
6625-376-4939						TEST SET, ELECTRON TUBE TV-7/U, TV-7A,B/U: dynamic mutual conductance type; 0.6 to 117V fil voltage range meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125V, 50 to 1000 cycles single phase; SW positions A thru E; portable type		NX		1,2,3	
6625-820-0064						TEST SET, ELECTRON TUBE TV-7D/U: dynamic mutual conductance type; 0.6 to 117V fil voltage range; meter indication; tube condition on 0 to 120 arbitrary scale; operating power requirements AC, 105 to 125V, 50 to 1000 cycles single phase; SW position A thru F, portable type		NX			
ORD THRU AGC	/	/	/	/		TECHNICAL MANUAL TM 11-6625-274-12			2		
5935-204-8379	/	/	/	/		ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-B-425536			1	8	E104
5935-537-4056	/	/	/	/		ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-C-179260			1	8	E105
5935-511-6491	/	/	/	/		ADAPTER, ELECTRON TUBE SOCKET: ECOM dwg SM-B-425538			1	8	E107
6625-684-1189	/	/	/	/		ADAPTER, TEST: ECOM dwg SM-B-425638			1	4	X3B
6625-618-9928	/	/	/	/		ADAPTER, TEST: ECOM dwg SM-B-425639			1	4	X7B
6625-618-9929	/	/	/	/		ADAPTER, TEST: ECOM dwg SM-B-425640			1	4	X10B
6625-727-7065	/	/	/	/		ADAPTER, ELECTRONIC TUBE SOCKET: nuvistor tube socket adapter; Hickock Inst Co. p/n 1050-127			1		
6625-069-1960	/	/	/	/		ADAPTER, TEST: socket for GE Micro-Miniature 7077 and 7486; Jettron Prod Inc p/n 86-060			1		
6625-668-4683	/	/	/			LEAD, TEST: ECOM dwg SM-B-425548			2	15	W101,W102
6625-727-7065				/		LEAD, TEST: ECOM dwg SM-B-45548			2	15	W101,W102

FEDERAL STOCK NUMBER	DESIGNATION BY MODEL						DESCRIPTION	UNIT OF ISSUE	EXP	QTY AUTH	ILLUSTRATION	
											FIGURE NO.	ITEM NO.
							TV-7/U; TV-7A,B,D/U (continued)					
							RUNNING SPARE ITEMS					
5960-262-0218	/	/	/	/			ELECTRON TUBE: MIL type 5Y3WGTA			1	15	V102
5960-100-7323	/	/	/	/			ELECTRON TUBE: MIL type 83			1		V101
6240-179-1814	/	/	/	/			LAMP, GLOW: GE p/n NE-45			1		E101
6240-014-2306	/	/	/	/			LAMP, INCANDESCENT: GE p/n 81			1		E103
6240-155-8706	/	/	/	/			LAMP, INCANDESCENT: GE p/n 47			1		E102

Page 37, Appendix III. Delete and substitute.

APPENDIX III
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance category.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part of component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) are listed in disassembly order or alphabetical order.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the categories.

(*a*) *Service.* To clean, to preserve, and to replenish lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute serviceable components, assemblies, or subassemblies, for unserviceable components, assemblies, or subassemblies.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Overhaul.* To restore an item to *completely serviceable* condition as prescribed by serviceability standards developed and published by heads of commodity commands. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(*j*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the

item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *Operator, organization, direct support, general support and depot.* The symbol X indicates the categories responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Categories higher than those marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *Operator, organization, direct support, general support and depot.* The dagger (†) symbol indicates the categories normally allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by electronic services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to an including general support are authorized to the organization operating this equipment.

SECTION II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON O/C	ECHELON O	ECHELON DS	ECHELON GS	ECHELON D	TOOLS REQUIRED	REMARKS
TEST SET ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
			X				8	Repair consists of replacing electron tubes, fuses, lamps, knobs and other easily replaced items
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	MAINTENANCE CATEGORY O/C	O	DS	GS	D	TOOL CODE	REMARKS
TV-7/U; TV-7A,B,D/U (continued)							
MULTIMETER TS-352/U				/	/	1	
RESISTOR DECADE ZM-16/U				/	/	2	
TEST SET ELECTRON TUBE TV-7/U				/		3	
TEST SET ELECTRON TUBE TV-2/U					/	4	
KIT, RADIO REPAIRMAN TK-87/U				/	/	5	
TRANSFORMER VARIABLE CN-16/U				/	/	6	
VOLTMETER, METER ME-30/U				/	/	7	
TOOL AND TEST EQUIPMENT AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		/				8	

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:
Active Army:

USASA (2)
CNGB (1)
CC-E (7)
Dir of Trans (1)
CofEngrs (1)
TSG (1)
CofSptS (1)
USAIB (5)
USARADBD (5)
USAAESWBD (5)
USAAVNTBD (5)
USACDCEA (1)
USACDCBRA (1)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
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USACDCTA (1)
USACDCADA (1)
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USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
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USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
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  USAREUR (5)
LOGCOMD (2)
USAMICOM (4)
USASMC (2)
USASCC (4)
USAECOM (17)
USASPTCP (30)
MDW (2)
Armies (2) except
  4th USA (5)
  EUSA (5)
507th USASA Gp (5)
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318th USASA Bn (5)
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  Ft Huachuca (10)
  WSMR (5)
  Ft Carson (19)
  Ft Knox (12)
  Ft Lee, Va. (5)
  JCA, Ft Ritchie (5)
  Ft Devens (5)
  USATCFE (5)
APG (5)
DPG (5)
USAEPG (5)
Yuma PG (5)
USMA (5)
Svc Colleges (2) except
  USAWC (5)
Br Svc Sch (2) except
  USACMLCS (5)
  USAIS (5)
  USAOC&S (5)
  USACSS (5)
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  USAARMS (5)
  USAADS (5)
  USATSCH (5)
  USAAVNS (5)
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USATC Inf (2)
USASTC (2)
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VFGH (5)
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Edgewood Arsenal (5)
MAAG (Vietnam) (5)
MAAG (Iran) (5)
MAAG (Rep of China) (5)
MAAG (Thailand) (5)
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USAERDAW (13)
USACRREL (2)
NLABS (5)
USAPA (5)
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WRAMC (1)
AFIP (5)
Army Pic Cen (2)
USAINTC (5)
USATTC (5)
Av Comm Cen (5)
USAJFKCENSPWAR (5)
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NG: State AG (3)—Units same as Active Army except allowance is one (1) copy each.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

U. S. GOVERNMENT PRINTING OFFICE : 1971 O - 480-504(5644A)

812-240

TECHNICAL MANUAL

Operator's and Organizational Maintenance Manual,

TEST SETS, ELECTRON TUBE TV–7/U, TV–7A/U, TV–7B–U AND TV/7D/U

TM 11–6625–274–12
CHANGES No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *30 January 1963*

TM 11–6625–274–12, 14 June 1960, is changed as follows:

Page 7. Add paragraph 1.1 after paragraph 1:

1.1. Index of Publications

Refer to the latest issue of DA Pamphlet 310–4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. Department of the Army Pamphlet No. 310–4 is a current index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders that are available through publications supply channels. The index lists the individual parts (–10, –20, –35P, etc.) and the latest changes to and revisions of each equipment publication.

Delete paragraph 2 and substitute:

2. Forms and Records

a. Reports of Unsatisfactory Equipment. Fill out DA Form 2407 (Maintenance Request) in accordance with instructions in TM 38–750 and forward it to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS–PIE, Fort Monmouth, N. J. The form should be filled out and forwarded to report:

(1) Receipt of defective equipment (use DA Form 6 (*b* below) if defect is due to damaged or improper shipment).

(2) Equipment deficiencies (deadlined equipment).

(3) Equipment shortcomings (operable, but at less than rated capability or efficiency).

(4) Equipment improvement suggestions and recommendations.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700–58 (Army), NAVSANDA Publication 378, and AFR 71–4 (Air Force).

c. Comments on Manual. Forward all comments on this publication direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS–MP, Forth Monmouth, N.J. (DA Form 1598 (Record of Comments on Publications), DA Form 2496 (Disposition Form), or letter may be used.)

Page 22. Make the following changes:

Chapter 3, heading. After the heading, add:

Section I. OPERATOR'S MAINTENANCE

Delete paragraph 31, 32, and 33 and figures 11 and 12, and substitute:

31. Scope of Operator's Maintenance

The maintenance duties assigned to the operator of Test Sets, Electron Tube TV–7/U, TV–7A/U, TV–7B/U, and TV–7D/U are listed below together with a reference to the paragraph covering the specific maintenance function. The duties assigned do not require tools or test equipment other than those issued with the equipment.

a. Daily maintenance service and inspection (par. 33).

b. Cleaning (par. 33.1).

c. Visual inspection (par. 34).

d. Tube replacement (par. 37).

e. Replacement of lamps (par. 39).

32. Operator's Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of the equipment to prevent the occurrence of trouble, to reduce *downtime*, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraph 33 cover systematic care essential to proper upkeep of the equipment when it is used daily. If the equipment is not used daily, however, the cleaning operations must be performed before operation, after any extended shutdown, or once a week while the equipment is kept in *standby* condition. The other items must be checked before the equipment is placed in operation after a shutdown, or after it is turned off, as specified in the applicable paragraph.

b. Maintenance Service and Inspection. The maintenance service and inspection chart (par. 33) outlines inspections to be made at specific intervals. These inspections are made to determine combat serviceability; that is, to determine that the equipment is in good general (physical) condition, in good operating condition, and likely to remain combat serviceable. To assist operators in determining and maintaining combat serviceability, the chart indicates what to inspect, how to inspect, and what the normal conditions are; the *References* column list the paragraph that contains additional information. If the defect cannot be remedied by the operator, higher echelon maintenance repair is required. Records and reports of these inspections must be made in accordance with TM 38–750.

33. Daily Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	INITIAL CHECK: Inspect the equipment for completeness and cleanliness.	Equipment must be complete, clean and dry, and free of grease, dirt, rust, corrosion, and fungus.	App. II and par. 33.1.
6	AC LINE CORD: Inspect ac line cord for kinks, fraying, cracked insulation and breaks.	Ac line cord must be in good condition. Tape frayed or cracked areas.	None.
8	PERFORMANCE: Perform the starting procedures given in paragraph 17.	As stated in paragraph 17----------	Par. 17.

33.1. Cleaning

Inspect the exterior of the test set. The exterior surfaces should be clean, free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

Warning: **Cleaning compound is flammable and its fumes are toxic. Provide adequate ventilation. *Do not* use near a flame.**

b. Remove grease, fungus, and ground-in dirt from the case; use a cloth dampened (not wet) with cleaning compound.

c. Remove dust or dirt from plugs and jacks with a brush.

Caution: **Do not press on the meter face (glass) when cleaning; the meter may be damaged.**

d. Clean the front panel, meter, and control knobs; use a soft clean cloth. If difficulty in removing dirt occurs, dampen the cloth with water; mild soap may be used to make the cleaning more effective.

Section II. ORGANIZATIONAL MAINTENANCE

33.2. Monthly Maintenance

Monthly maintenance on Test Set, Electron Tube TV–7(*)/U will be scheduled in accordance with the requirements of TM 38–750. If the equipment is part of a vehicular installation, the monthly maintenance should be scheduled concurrently with the periodic service schedule of the carrying vehicle to reduce out-of-service time to a minimum. All deficiencies or shortcomings will be recorded, and those not corrected during the inspection and service will be immediately reported to higher echelon by

use of forms and procedures specified by TM-38–750. Equipment with a deficiency that cannot be corrected by second echelon should be deadlined in accordance with TM 38–750. Perform all the services listed in the monthly maintenance and inspection chart (par. 33.3) in the sequence listed. Whenever a *normal condition or result* is not observed, take corrective action in accordance with the paragraph listed under the *Reference* column.

33.3 Monthly Maintenance Service and Inspection Chart

Item No.	Procedure		References
	Item	Normal condition or result	
1	INITIAL CHECK: Inspect the equipment for:		
	a. Completeness	*a.* Equipment must be complete.	*a.* App. II.
	b. Cleanliness	b. Unit must be clean and dry inside and out; free of grease, dirt, rust, corrosion, and fungus.	*b.* Par. 33.1.
2	PUBLICATIONS: Check to see that pertinent publications are available.	*a.* Manual must be complete and in usable condition without missing pages.	*a.* Par. 1.1
		b. All changes pertinent to the equipment are on hand.	*b.* DA Pam 310–4 for requirements.
3	MODIFICATION WORK ORDERS: Check DA Pam 310–4 to determine if new applicable MWO's have been published.	ALL URGENT MWO's have been applied to the equipment. All ROUTINE MWO's have been scheduled.	DA Pam 310–4.
4	PLUCKOUT ITEMS: Inspect the seating of fuse and tubes.	All items should be properly seated	None.
5	EXTERNAL HARDWARE: Inspect exterior hardware for looseness or binding.	*a.* All knobs must be present and firmly secured to their respective shafts.	*a.* None.
		b. All control and switch shafts must not bind.	*b.* Higher echelon maintenance required.
		c. The carrying handle and other hardware must be tight.	*c.* Higher echelon maintenance required.
6	AC LINE CORD: Inspect ac line cord for kinks, fraying, cracked insulation, and breaks.	Ac line cord must be in good condition. Tape frayed or cracked areas.	None.
7	INTERIOR: Inspect interior components and hardware for cleanliness and general physical condition.	*a.* Interior components and hardware must be free of dust, dirt, corrosion, fungus, and moisture.	*a.* None.
		b. Resistors, capacitors, and insulators must be free of cracks, blistering, burns, and discoloration.	*b.* None.
8	PERFORMANCE: Perform the procedures in the equipment performance checklist (par. 35).	As stated in paragraph 35	Par. 35.
9	SPARE PARTS: Check all spare parts (operator and organizational) for general condition and method of storage.	All spare parts must be in good condition and properly stored. There should be no evidence of overstock, and all shortages will be on valid requisitions.	App. II.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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USA SPWAR Cen (5)
Army Tml (1)
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OSA (1)
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Ft Huachuca (2)
USA Elct R&D Activity (WSMR) (13)
AFIP (1)
AMS (1)
USA Pictorial Cen (2)
USA Mobility Spt Cen (1)
USA Strat Comm Comd (4)
USA Elct Mat Agcy (25)
Chicago Proc Dist (1)
USA CARIB SIG Agcy (1)
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TECHNICAL MANUAL
No. 11-6625-274-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *14 June 1960*

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

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***This manual supersedes so much of TM 11-5083, 29 September 1953, including C1, 2 September 1955; C2, 8 February 1956, and C3, 1 April 1959, as pertains to operation and organizational maintenance; so much of C4, 26 August 1959, as pertains to packaging and repackaging; TM 11-6625-274-10P, 11 June 1959, and so much of TM 11-6625-274-20P, 11 June 1959, as pertains to the maintenance allocation chart.**

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Sets, Electron Tube TV-7/U (fig. 1), TV-7A/U (fig. 2), TV-7B/U (fig. 3), and TV-7D/U (fig. 4), and covers installation, operation, and first and second echelon maintenance. It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to first and second echelon maintenance personnel.

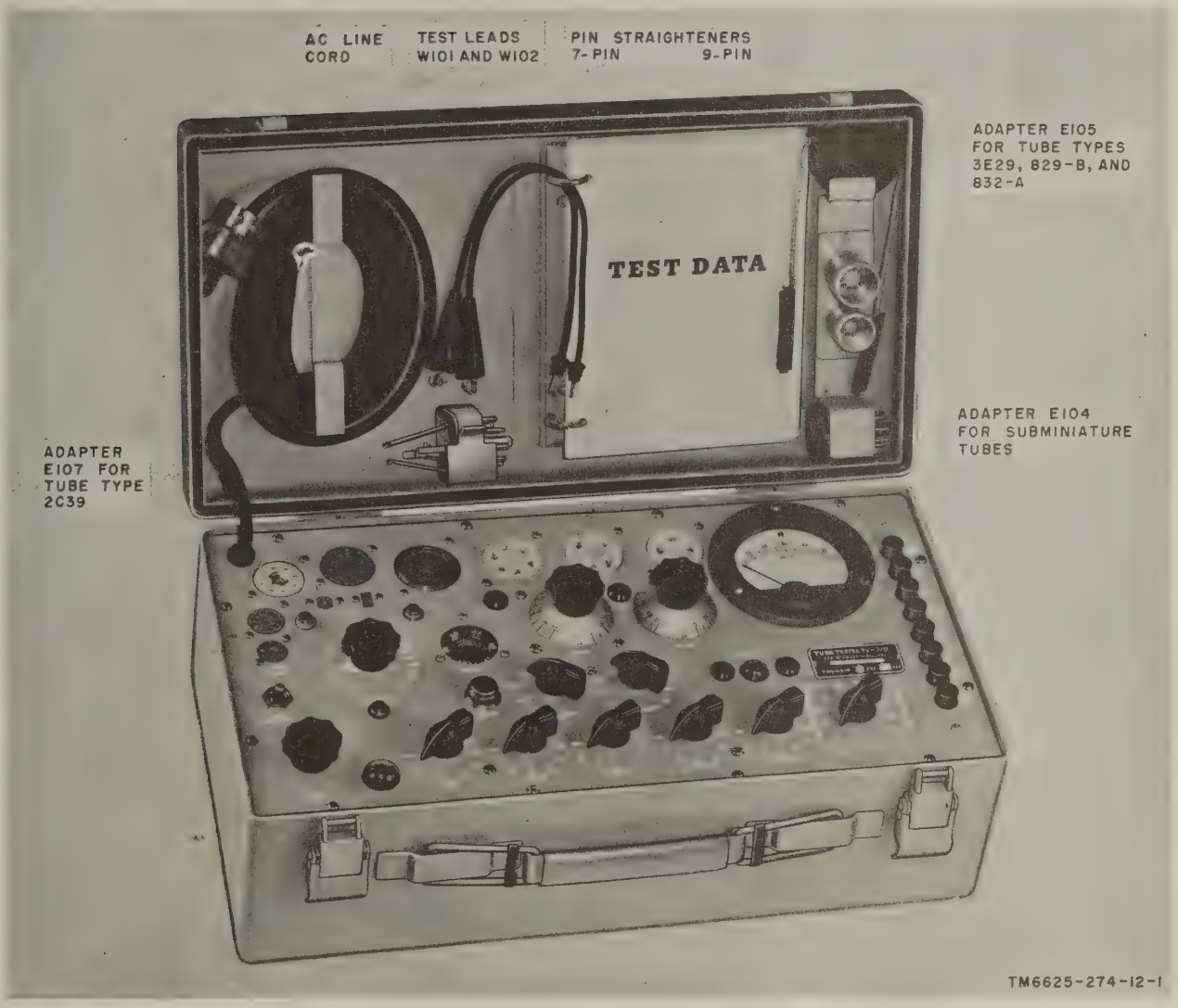
AC LINE CORD
TEST LEADS W101 AND W102
PIN STRAIGHTENERS 7-PIN 9-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST DATA
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
TM6625-274-12-1

Figure 1. Test Set, Electron Tube TV-7/U, less running spares.

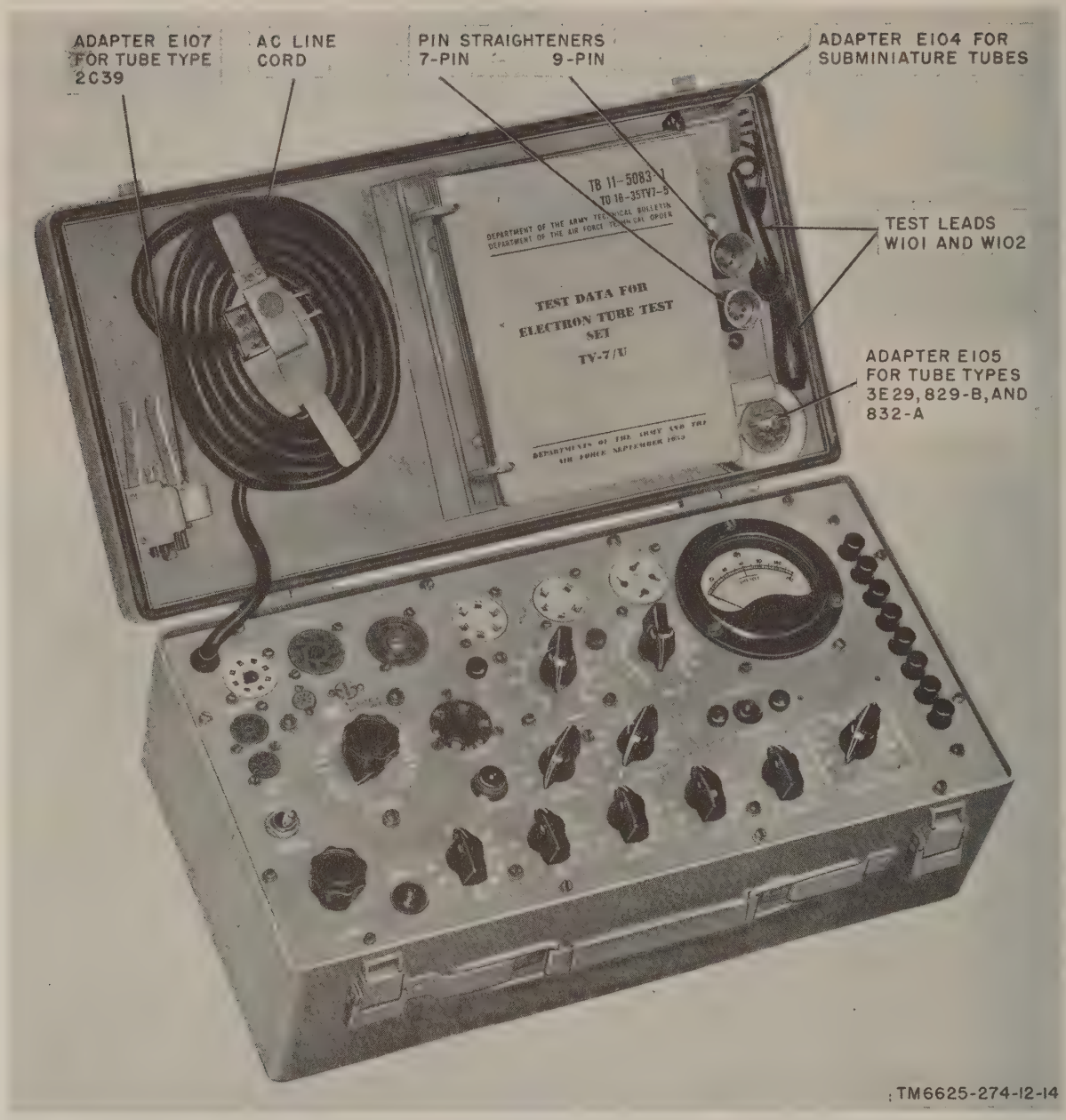

Figure 2. Test Set, Electron Tube TV–7A/U, less running spares.

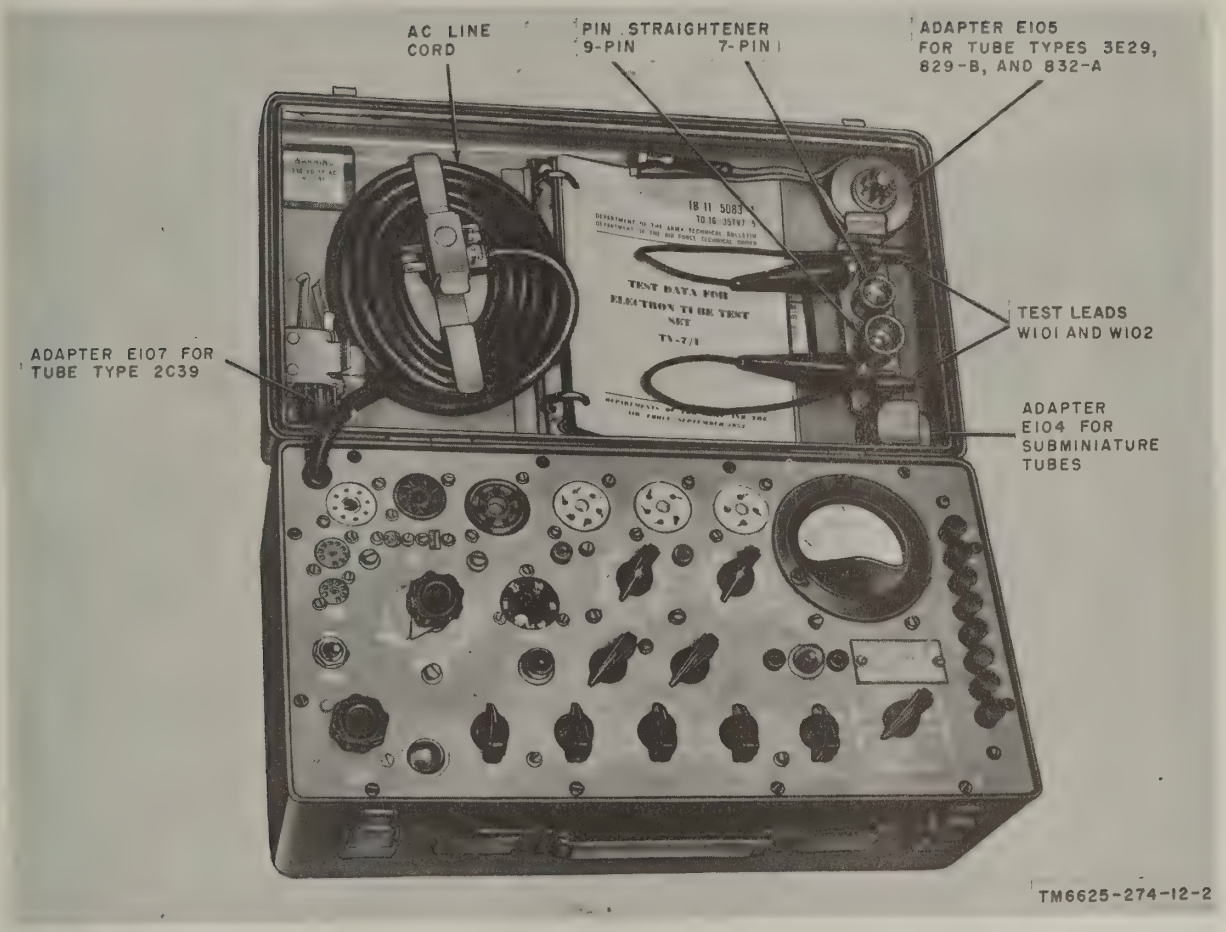
AC LINE CORD
PIN STRAIGHTENER 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER E104 FOR SUBMINIATURE TUBES
TM6625-274-12-2

Figure 3. Test Set, Electron Tube TV–7B/U, less running spares.

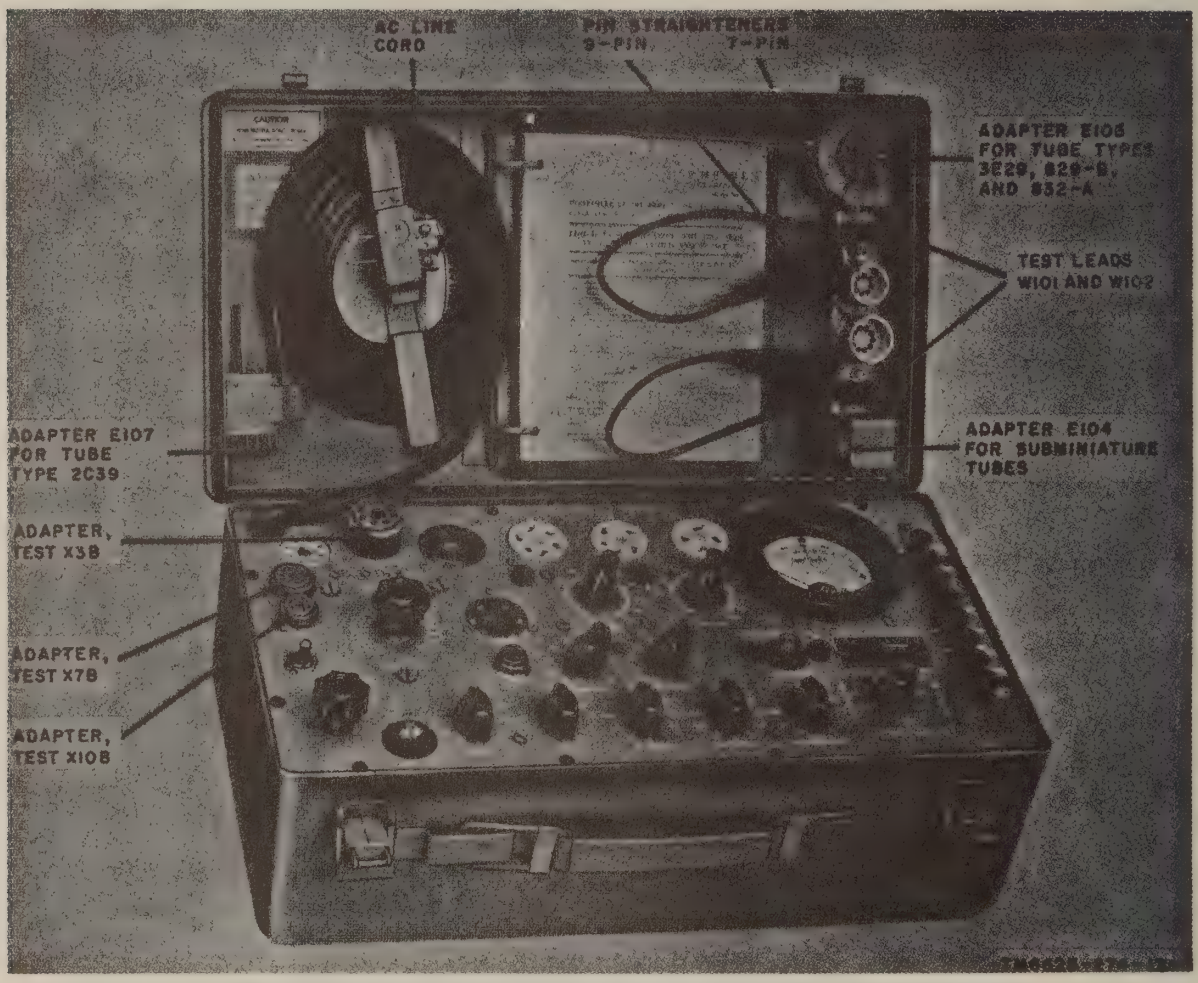
AC LINE CORD
PIN STRAIGHTENERS 9-PIN, 7-PIN
ADAPTER E106 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER, TEST X3B
ADAPTER, TEST X7B
ADAPTER, TEST X10B

Figure 4. Test Set, Electron Tube TV–7D/U, less running spares.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Test Set, Electron Tube TV-7(*)/U represents Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

2. Forms and Records

a. Electronic Failure Report. Fill out and forward DD Form 787-1, Electronic Failure Report-Signal Equipment, to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-39.

b. Unsatisfactory Equipment Report. Fill out and forward AF TO Form 29, Unsatisfactory Report, to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

c. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6, Report of Damaged or Improper Shipment, as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

d. Preventive Maintenance Form. Prepare DA Form 11-266 (fig. 11 and 12), Maintenance Check List for Signal Equipment (Test Equipment), in accordance with instructions on the form.

e. Parts List Form. Any comments concerning omissions and discrepancies in appendix II or III in this manual will be prepared on DA Form 2028 and forwarded directly to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J. ATTN: SIGFM/ES-ML.

f. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Test Set, Electron Tube TV-7(*)/U is a portable tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limits for electron tubes used in receivers, low-powered transmitters, and many other electronic equipments. The following tests can be made with Test Set Electron Tube TV-7(*)/U:

a. Continuity test (ballast tubes).

b. Dynamic mutual conductance test (amplifier tubes).

c. Emission test (rectifier tubes).

d. Gas test (amplifier tubes).

e. Noise test.

f. Panel lamp test.

g. Shorts test.

4. Technical Characteristics

Power Supply:	
Input voltage	103.5 to 126.5 volts ac, single phase.
Frequency	50 to 1,000 cps.
Power consumption ..	45 watts at 115 volts, 50 cps.
Meter	0 to 120 arbitrary units.
Operating temperature limits	—40° to +125° Fahrenheit.
Number of tubes	2.
Indicator lights:	
PILOT	One type 47.
SHORTS	One type NE-45.
FUSE	One type 81.

5. Table of Components

The components of Test Set, Electron Tube TV-7(*)/U are listed in *a* below and the spare parts in *b* below.

a. Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Length	
1	Test set including tubes and lamps	6 1/16	8¾	15¾	18
1	Adapter E105: 3E29, 829-B or 832-A tubes				
1	Adapter E107: 2C39 tube				
1	Adapter E104: Subminiature tubes				
1	Adapter X10B: socket saver, 7-pin miniature (TV-7D/U)				
1	Adapter X7B: socket saver, 9-pin miniature (TV-7D/U)				
1	Adapter X3B: socket saver, octal (TV-7D/U)				
2	Test leads				
1 set	Running spares (*b* below)			15	

b. Spare Parts.

Quantity	Item
1	Electron tube, type 5Y3WGTA
1	Electron tube, type 83
1	Lamp, neon NE-45
1	Lamp, incandescent No. 47
1	Lamp, incandescent No. 81

6. Description of Test Set

(fig. 1-4)

a. Test Set, Electron Tube TV-7(*)/U (test set) is self-contained in a carrying case equipped with a carrying handle. The cover is secured to the case by luggage-type fasteners. Retainer brackets on the inside of the cover are used to secure and store the power cable, pin straighteners for 7- and 9-pin miniature tubes, and adapters (par. 16). A ring binder inside the cover holds TB 11-5083-1 (tube test data book (par. 15)). The cover is hinged by slip hinges and can be removed from the case.

b. An indicating meter and all controls, knobs, pushbuttons, sockets, and indicating lamps are on the front panel. The necessary data for setting and operating the controls to test the various tube types are contained in the tube test data book (*a* above). One end of the alternating current (ac) line cord is permanently attached to the panel; the other end terminates in a male plug.

7. Differences in Models

Test Sets, Electron Tube TV-7(*)/U are similar in purpose, operation, and appearance. Some models have been modified to improve operational features. External differences are as follows:

Item	TV-7/U	TV-7A/U	TV-7B/7	TV-7D/U
F RANGE on FUNCTION SWITCH.	Not used.	Not used.	Not used.	Used.
BIAS and SHUNT controls	Markings engraved on a dial.	Markings etched into test set panel.	Markings etched into test set panel.	Markings etched into test set panel.
SHORTS lamp	No panel marking.	Panel marking.	Panel marking.	Panel marking.
Subminiature tube test socket X109.	Rectangular.	Round on some equipments.	Rectangular.	Rectangular.
Storage clip for ac line cord plug.	Not used.	Used.	Used.	Used.
Storage clips for test leads	Not used.	Not used.	Used.	Used.
Tip of test lead plug (2 each)	3/32-inch diameter.	5/64-inch diameter.	3/32-inch diameter.	3/32-inch diameter.

Item	TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
Grid (G), plate (P), and NOISE jacks.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 5/64-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.
Gasket around edge of cover	Not used.	Used.	Used.	Used.
Socket saver adapters X10B, X7B, and X3B, 7-pin and 9-pin miniature and octal base.	Not provided.	Not provided.	Not provided.	Provided.

CHAPTER 2
INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the test set is packaged in an inner fiberboard carton. Spare parts are in a small, corrugated carton, protected by a sleeve on top of the test set. The inner fiberboard carton is sealed with gummed tape, and is then placed within an outer fiberboard carton, with all seams and joints sealed with water-resistant, pressure-sensitive tape. A wooden packing case may also be used when a multiple of four test sets is shipped. The wooden packing case will be strapped only for intertheater shipment. A typical packing case and its contents are shown in figure 5.

(1) The inside dimensions of a packing case that contains four packaged test sets is approximately 18¾ by 20½ by 15¾ inches; the volume is 4.8 cubic feet, and the weight is 106 pounds.

(2) The outside dimensions of a test set packed in fiberboard cartons is 21½ by 10⅞ by 8½ inches; the volume is

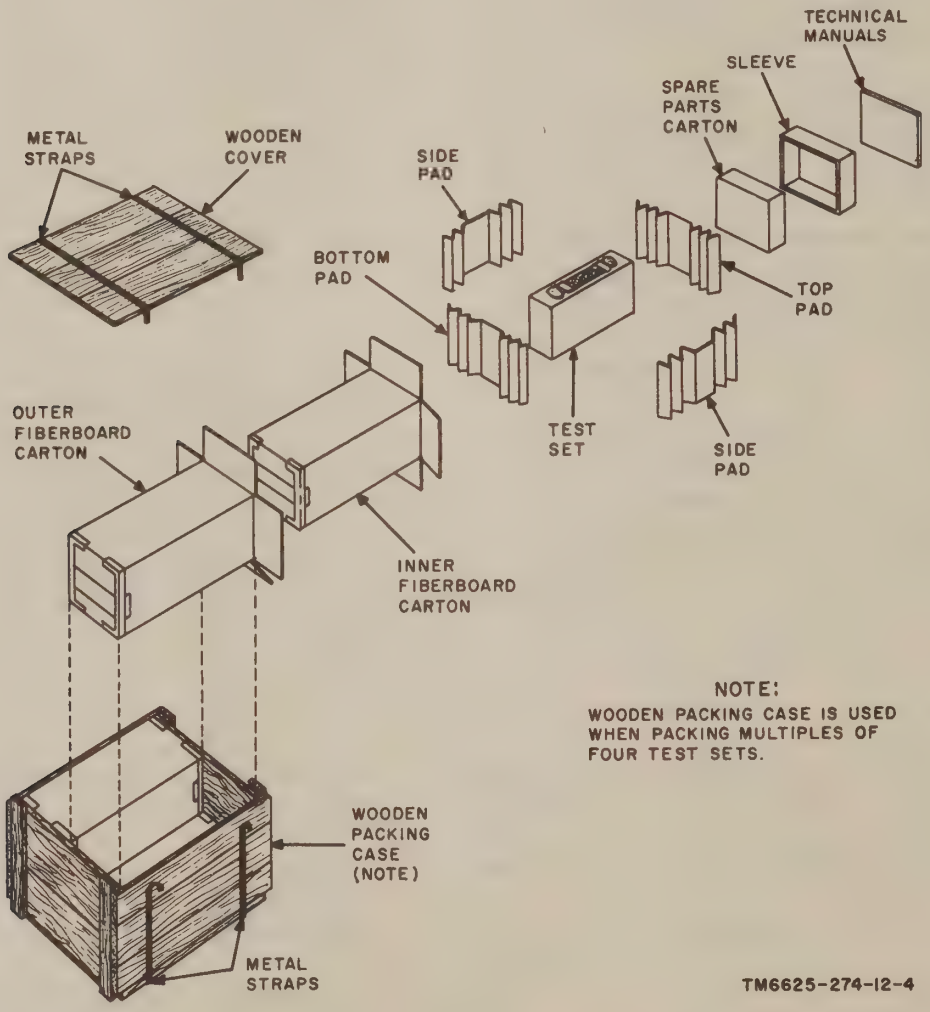

Figure 5. Typical packaging.

1.2 cubic feet, and the weight is 21½ pounds.

b. Removing Contents.

(1) Cut and fold back the metal straps (when used).

(2) Remove the nails from the wooden cover and one side of the wooden packing case with a nailpuller. Remove the cover and the side. Do not attempt to pry off the cover or the side; prying may damage the equipment.

(3) Remove the envelope that contains the technical manuals.

(4) Remove the outer fiberboard carton from the wooden packing case.

(5) Open the outer fiberboard carton and remove the inner fiberboard carton.

(6) Open the inner fiberboard carton and remove the contents.

9. Checking Unpacked Equipment

Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (par. 5) as a general check. If the equipment is damaged, refer to paragraph 2. After a test set is removed from its fiberboard container, release the fasteners, open the cover, and proceed as follows:

a. Check to see that the adapters (fig. 8) are held firmly to the cover.

b. Check all controls for ease of rotation. Tighten loose knobs.

c. Check for a broken meter glass and broken lamps.

d. Check the ac line cord, test leads, and rubber gasket around the edge of the cover (except on TV-7/U) for signs of deterioration.

Section II. CONTROLS AND INDICATORS

10. General

Improper setting of the FILAMENT VOLTAGE switch (fig. 6) or incorrect operation of the pushbutton switches may damage the tube under test. Be sure that all the controls and switches are set properly before testing tubes.

11. Controls, Indicators, and Jacks

a. Switches and Controls.

Switch or control	Function
POWER switch	ON: Connects ac power to test set. OFF: Removes ac power from test set.
FILAMENT VOLTAGE (20-position rotary switch)	Provides an 18-step selection of filament voltages from 0.6-volt to 117 volts ac. BLST.: Enables ballast tubes to be tested for continuity and supplies voltage to certain rectifier tubes for emission tests.
	OFF: Removes voltage from FILAMENT VOLTAGE switch.
FILAMENT selectors, left and right (10-position, 5-section rotary switches)	Connects filament of tube under test to filament voltage supply.
GRID selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects control grid of tube under test to bias and signal voltages.
PLATE selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects plate of tube under test to plate voltage supply.
SCREEN selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects screen grid of tube under test to screen voltage supply.
CATHODE selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects cathode of tube under test to desired test circuit.
SUPPRESSOR selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects suppressor grid of tube under test to desired test circuit.

Switch or control	Function
FUNCTION SWITCH (11-position, 8-section rotary switch (TV–7D/U), 10-position, 6-section rotary switch on all other models)	SHORTS: Positions 1-5 connect various elements of tube under test to shorts test circuit.
	RANGES: Positions A-E (A-F, TV–7D/U) control sensitivity of meter circuit and magnitude of signal voltage.
LINE ADJUST control	Adjusts amount of input voltage to power transformer.
BIAS control	Adjusts amount of bias voltage applied to tube under test.
SHUNT control	Adjusts sensitivity of meter circuit.

b. Pushbutton Switches.

Pushbutton switch	Function	
	Switch position	*Action*
1—LINE ADJ.	Depressed	Connects meter into line test circuit.
	Normal	Disconnects meter from line test circuit.
2—DIODE	Depressed	Connects diode tube under test to an ac test voltage, and connects low screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed. [a]
	Normal	Removes ac test voltage from diode under test and connects normal screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed.
3—MUT. COND.	Depressed	Connects tube under test to plate and screen grid (when required) voltages.
	Normal	Removes plate and screen grid (when used) voltages from tube under test.
4—GAS 1	Depressed	Connects ac test voltage to certain diode tubes and connects plate voltage and bias voltage to tube under test when checking amplifier tubes for gas.
	Normal	Removes diode test voltage or plate voltage and bias voltage from amplifier tube under test.
5—GAS 2 (used with 4—GAS 1 when amplifier tubes are tested for gas)	Depressed	Connects a resistor into control grid circuit of tube under test.
	Normal	Short-circuits resistor in control grid circuit of tube under test.
6—OZ4	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
7—RECT.	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
8—METER REV.	Depressed	Reverses polarity of voltage applied to meter.
	Normal	Permits normal polarity of voltage to be applied to meter.

[a] Voltage will vary slightly, depending on LINE ADJUST setting.

c. Meter, Indicator Lamps, and Jacks.

Note. The jacks on the TV–7A/U accommodate 5/64-inch diameter tip plugs; the jacks on all other models of the test set accommodate 3/32-inch diameter tip plugs.

Meter, indicator lamp, or jack	Function
Meter	Indicates condition of tube under test. A LINE TEST mark at midscale is used to establish correct input voltage to power transformer.
SHORTS lamp (not a panel marking on TV–7/U)	Indicates and locates shorted tube elements.
PILOT lamp	Indicates when power is delivered to test set.
FUSE lamp	A fuse and an overload indicator.
Grid (G) and plate (P) jacks	Provide a means of connecting grid and plate test leads to bias and plate voltage circuits, respectively.
NOISE test jacks (2)	Enables test set operator to check level of noise generated by tube under test.

Section III. OPERATION UNDER USUAL CONDITIONS

12. General Instructions

Do not operate the test set until the functions of the controls and the indicators (par. 11), the operating procedure (par. 18), and the use of the test data book (par. 15) are understood. Refer to paragraph 24 whenever a special testing procedure is indicated in the test data book.

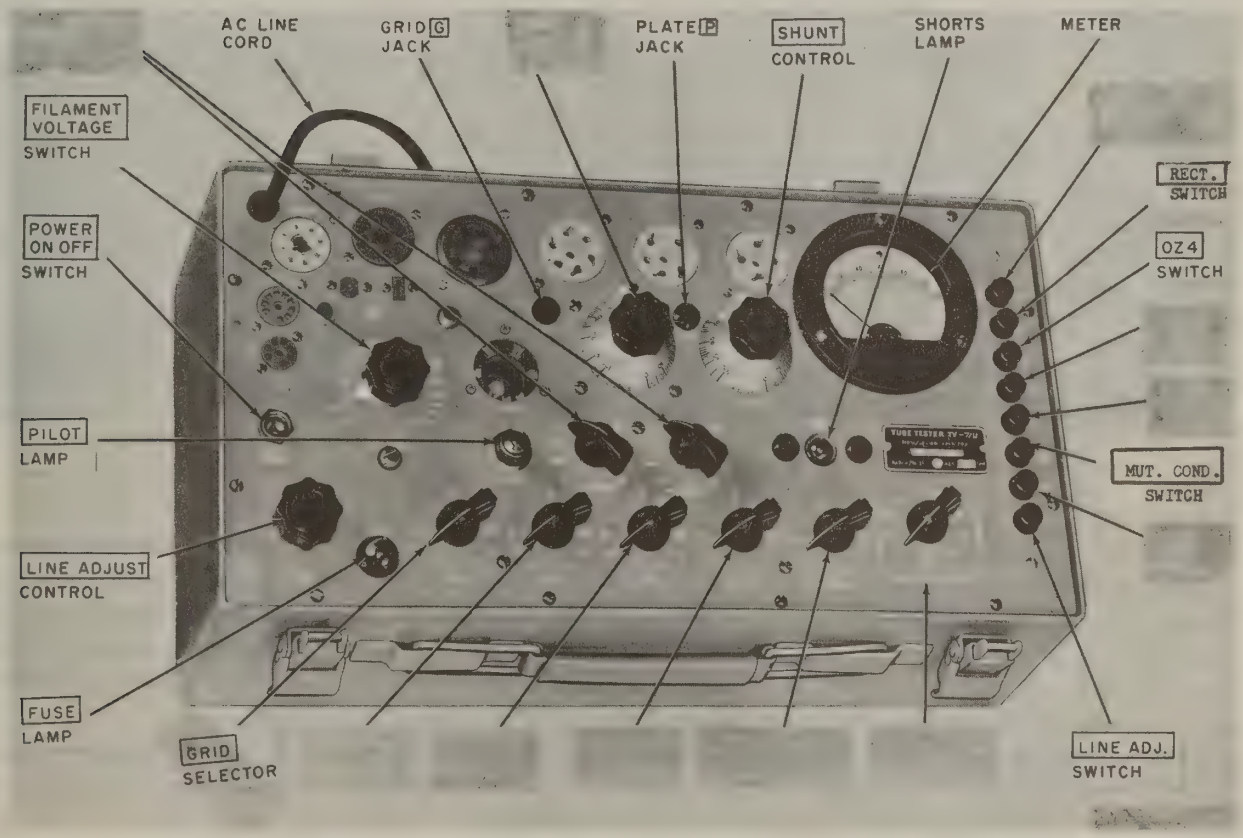

Figure 6. Test Set, Electron Tube TV–7/U, front panel.

13. Test Leads

Two test leads are provided to make connections from the grid (G) and the plate (P) panel jacks to the top caps of tubes under test. Each test lead is terminated on one end in a 3/32-inch diameter tip plug(5/64-inch on TV-7A/U) and on the other end in a battery-type clip with an insulating cover. The test leads are stored inside the cover of the test set case.

14. Tube Test Sockets

(fig. 7)

After the controls on the test set have been set as directed in the tube test data book (par. 15), place the tube to be tested in the proper tube test socket listed below. Socket-saver adapters (par. 16*d*) are mounted in the 7- and 9-pin miniature sockets and in the octal socket on the TV-7D/U (fig. 4).

Tube test socket	Tube type tested
4 pin	Four-pin standard tubes.
5 pin	Five-pin standard tubes.
6 pin	Six-pin standard tubes.
7 pin	Seven-pin standard tubes and panel lamps.
OCTAL	Octal (8-pin) tubes.
LOKTAL	Loktal base (8-pin) tubes.
SUB MIN. (2)	Round (8-pin) or flat-type (7-pin) subminiature tubes.
NOVAL	Nine-pin miniature tubes.
7 PIN MIN	Seven-pin miniature tubes.
ACORN	Acorn type tubes.

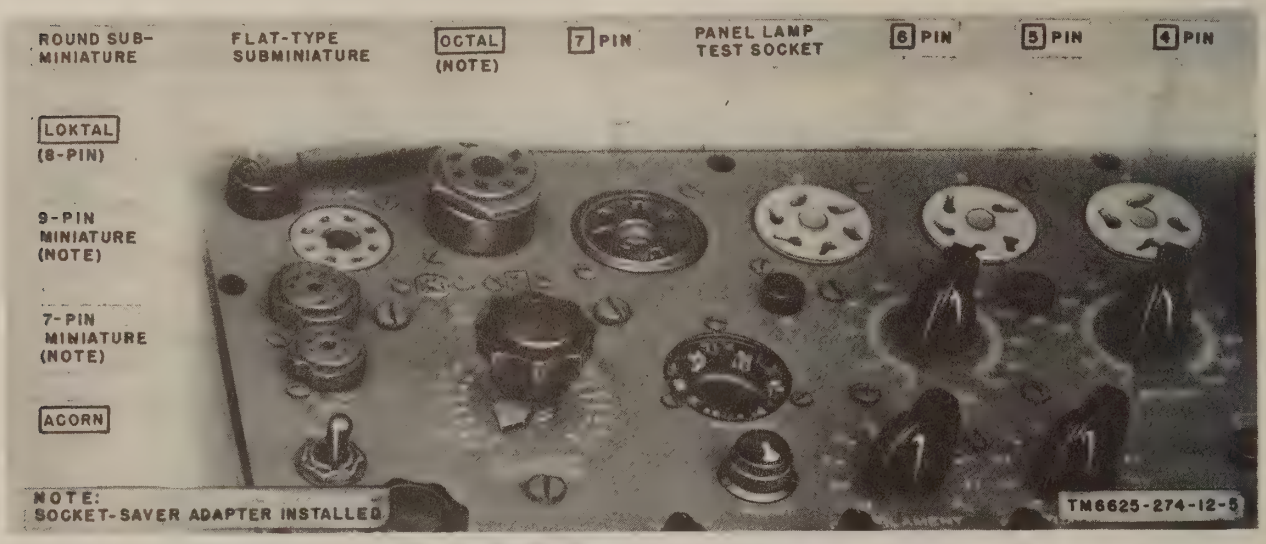

Figure 7. Test sockets, socket-saver adapters installed.

15. Tube Test Data

TB 11-5083-1 (test data book) is mounted on the inside of the cover of the test set. The test data book contains operating instructions for the test set, information necessary to set the controls when testing various tube types, a conversion table for VT tube designations, and a data table for CV type tubes. The control settings for the various tube types are tabulated in nine columns. Read the headings from left to right as follows:

a. Tube Type. Type numbers of electron tubes which the test set is designed to test are listed numerically and alphabetically in this column. Tubes that have type letters instead of numbers, such as XXB, are listed at the end of the table.

b. Fil. Correct filament or heater voltages for the listed tube types are shown in this column.

c. Selectors. The correct setting for the two FILAMENT selectors and the GRID, PLATE,

SCREEN, CATHODE, and SUPPRESSOR selectors are listed in this column. The settings are shown in the same order in which the switches appear on the panel, listing first the two FILAMENT selectors and then continuing, from left to right, with the remaining selectors.

d. Bias. This column lists the setting for the BIAS control.

e. Shunt. This column lists the setting for the SHUNT control. Setting of this control is required only when the FUNCTION SWITCH is in the RANGES A SHUNT position.

f. Range. The settings for the FUNCTION SWITCH are listed in this column. The letters A through E (A through F, TV-7D/U) correspond to the RANGES markings for the FUNCTION SWITCH.

g. Press. Under this heading are listed the test pushbuttons that are used for the various tube types and their individual sections in the case of multipurpose tubes.

h. Min Value. The minimum, numerical values of meter indication for the various tubes and individual sections of multipurpose tubes are shown in this column. Any tube showing a meter reading less than the value indicated in this column should be replaced.

i. Notations. Special information pertaining to particular tube types is listed under this heading.

16. Adapters

a. Adapter E104. Adapter E104 (fig. 8) enables subminiature tubes with long leads to be tested in the OCTAL socket of the test set. A spring locking action grips the leads of the tube after they are inserted in the adapter. Pull the two tabs upward to open the lock before inserting the leads. The lock is secured by pressing down on the two tabs until a click is heard.

b. Adapter E105. Adapter E105 (fig. 8) enables tube type 3E29, 829-B, or 832-A to be tested in the OCTAL socket of the test set. The adapter consists of a special socket for these tubes mounted on an octal base. The two leads on the adapter connect to the two plate caps of the tube under test.

c. Adapter E107. Adapter E107 (fig. 8) enables tube type 2C39 (a lighthouse tube) to be tested in the OCTAL socket of the test set. The three pairs of spring contacts, from the center outward, connect to the cathode and one side of the filament, to the grid, and to the plate, respectively, of the tube under test. The center contact connects to the other side of the filament of the tube under test.

d. *Socket-Saver Adapters (TV-7D/U).* Three socket-saver adapters (fig. 7) are included with each TV-7D/U: one 7-pin miniature, one 9-pin miniature, and one octal. The adapters are installed in their corresponding sockets and receive the wear rather than the permanent socket. When worn so that satisfactory contact can no longer be made, the socket-saver adapters can be replaced without disconnecting the leads from their respective test socket.

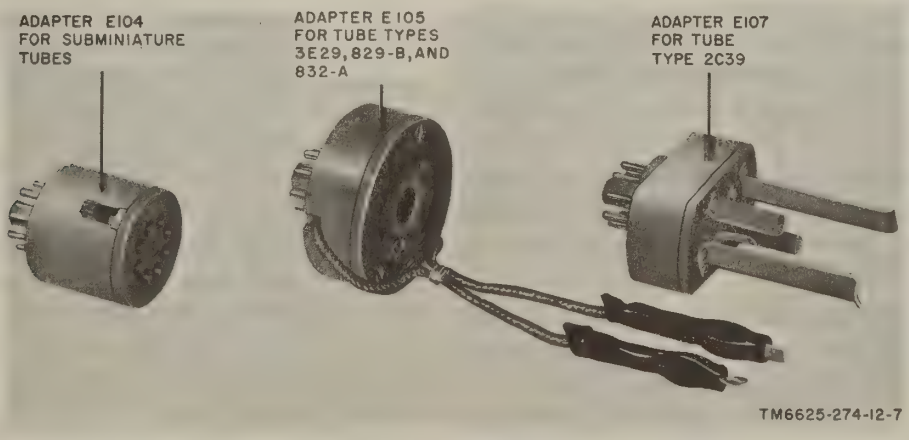

Figure 8. Adapters E104, E105, and E107.

17. Starting Procedure

Before operating the test set, perform the starting procedure below to check the general operation of the equipment. If the results obtained from the procedures in *b* through *e* below are satisfactory, the test set is ready for operation.

Note. If an abnormal indication is obtained during the starting procedure, refer to the equipment performance checklist (par. 35) for corrective measures.

a. Connect the test set to a 115-volt ac, 50- to 1,000-cycle per second (cps), power source.

b. Set the POWER switch to the ON position; the PILOT lamp should light.

c. Press pushbutton 1 — LINE ADJ. Rotate the LINE ADJUST control knob until the meter pointer rests over the LINE TEST mark on the meter face.

d. Release pushbutton 1 — LINE ADJ.

e. Check the short test circuit.

(1) Set the left FILAMENT selector at A, the right FILAMENT selector at P, and the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selectors at 0, 0, 0, 2, and 2, respectively.

(2) Rotate the FUNCTION SWITCH through the five SHORTS positions. The neon SHORTS lamp (fig. 6) should glow in positions 2 and 3 of the FUNCTION SWITCH to indicate that the short test circuit is functioning properly.

f. Set the POWER switch to the OFF position.

18. Operating Procedure

The procedures below apply to single-section and multipurpose tubes (tubes that have more than one set of elements in the same envelope). Test each section or group of elements of a multipurpose tube separately. Test data for the multipurpose tube types are listed by sections (pentode sect., triode sect., diode sect., etc) in the test data book.

Caution: **Do not insert a tube into a test socket until all the controls have been set in accordance with the instructions below.**

a. Selectors. The FILAMENT (left and right), GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches select the test socket connections so that correct test voltages are applied to the elements of the tube under test. For clarity, these selector switches will, in some instances, be referred to collectively as "the selectors". When referred to collectively, they are considered in the same order as above.

b. Setting Controls.

(1) Locate the type number of the tube to be tested in the test data book (fig. 1-4).

(2) Turn the FILAMENT VOLTAGE knob to the position shown in the *Fil* column of the test data book.

(3) Set the selectors to the letters and the numbers indicated in the *Selectors* column in the test data book. Be sure the numbers indicated by the selector knobs are the same, if read from left to right, as the numbers in the test data book.

Example: To test a tube type 6SN7, the *Selectors* column in the test data book indicates that the selectors are to be set at HY4–5062. Start at the left and turn the FILAMENT (left) selector knob to H, and the FILAMENT (right) selector knob to Y. Turn the GRID selector knob to number 4; the PLATE selector knob to number 5; the SCREEN selector knob to number 0; the CATHODE selector knob to number 6; and the SUPPRESSOR selector knob to 2. The sequence of letters and numbers thus selected (HY4-5062) is identical with that listed in the test data book. The selectors are interconnected electrically so that two different voltages cannot be applied to the same tube pin at the same time. Therefore, accidental shorts are avoided.

(4) Set the BIAS control to the number indicated in the *Bias* column of the test data book.

(5) Set the SHUNT control to the number indicated in the *Shunt* column of the test data book. If no setting is indicated, disregard this step and proceed with the steps below.

(6) Set the FUNCTION SWITCH knob to 1.

(7) Insert the tube to be tested in the

proper test socket (fig. 7) and, if the instructions in the *Notations* column require it, connect panel jacks G or P to the tube caps with the test leads.

(8) Set the POWER switch to the ON position. The PILOT lamp should light.

Note. For tubes of the heater cathode type, allow approximately 5 to 10 seconds for the cathode to reach operating temperature before testing the tube.

(9) Adjust the meter pointer (par. 17*c* and *d*) to the LINE TEST mark on the meter scale.

Note. Some tubes, such as the 17DE4 and the 32ET5, require the meter pointer to be set at a position other than the LINE TEST mark. Refer to the *Notations* column of the test data book before testing the tube.

c. Shorts Test.

(1) Turn the FUNCTION SWITCH knob from position 1 to position 5; meanwhile tap the tube lightly and watch the neon SHORTS lamp on each switch position. Tubes with shorted elements will cause the lamp to glow.

Note. A list of tubes that are not to be tapped during the shorts test is contained in the test data book.

(2) A short is indicated by a steady glow on *both* halves of the SHORTS lamp. A flash when the switch is turned from one position to another does not indicate a defective tube. Intermittent flashing when the tube is tapped indicates the existence of loose elements which can cause noisy or erratic operation.

(3) Tubes that have more than one section, such as the 25D8, must be tested for shorts on each section.

(4) Discard a shorted tube without further tests.

Note. Some tubes will show a shorted condition on certain positions of the FUNCTION SWITCH even though they are good tubes. Check the *Notations* column in the test data book for remarks. "Short on 1 and 2" would mean that a short indication in positions 1 and 2 is normal.

(5) If the tube is not shorted, other tests may be performed as required.

d. Selection of Range. Turn the FUNCTION SWITCH knob from the SHORTS side of the switch to the RANGES position indicated in the test data book under the column headed *Range*. This automatically sets the sensitivity of the meter circuit to the proper level for the tube under test.

e. Operating Pushbuttons.

***Caution:* Do not press pushbutton 3 — MUT. COND. when testing rectifier tubes.**

(1) Press the pushbutton (par. 11*b*) that is indicated in the *Press* column of the test data book.

***Caution:* Release the pushbutton as soon as the meter pointer comes to rest and the meter indication is read. If the pushbutton is depressed too long, the tube under test may be damaged.**

(2) Refer to the *Notations* column for special information pertaining to specific tube types.

(3) When the correct pushbutton is depressed, the meter will indicate the condition of the tube. Compare the meter reading to the value indicated in the *Min value* column of the test data book.

19. Checking Filament Continuity (12-Volt Filament Tubes)

Certain electron tubes in the 12-series may have open filament center taps that may not affect the testing or the operation of these tubes, if the tube is used in a 12-volt filament circuit. The test set does not have a specific filament continuity test circuit. A visual check for filament continuity of tube types 12AT7, 12AU7, 12AV7, 12AX7, and 12AZ7 can be made as follows:

a. Perform the starting procedures (par. 17).

b. Set the FILAMENT VOLTAGE switch to 12.6.

c. Set the left and right FILAMENT selector switches to E and to V, respectively.

d. Set the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches each at zero.

e. Insert the tube in its proper test socket and perform the procedures in paragraph 17*b* through *d*.

f. Observe the filament of the tube; both sides should be lighted.

Note. Do not prolong the continuity test; keep the filament lighted just long enough to make a thorough observation.

g. Set the POWER switch to the OFF position, and set the FILAMENT VOLTAGE switch to 6.3.

h. Set the left and right FILAMENT selector switches to K and V, respectively.

i. Perform the procedures in paragraph 17*b* through *d*.

j. Observe the filament of the tube; only one-half the filament should be lighted.

k. Set the POWER switch to the OFF position, and set the left and right FILAMENT selector switches to E and Z, respectively.

l. Perform the procedures in paragraph 17*b* through *d*.

m. Observe the filament of the tube; the other half of the filament should be lighted.

n. If the tube shows filament continuity, proceed to test the tube in accordance with the instructions in paragraphs 20 through 22.

20. Reading Meter

The meter scale is calibrated in divisions from 0 to 120. When the proper pushbutton is depressed, the meter pointer will indicate the condition of the tube under test as a numerical value. The numerical value of the meter reading is then compared to the minimum acceptable value in the *Min value* column in the test data book. If the number indicated on the meter is less than the listed minimum value, the tube should be replaced. The following chart may be used to convert the numerical value of the meter reading to mutual conductance in micromhos.

Meter reading	Corresponding value in micromhos			
	Range B	Range C	Range D	Range E (Note)
0	0	0	0	0
10	250	500	1,250	2,500
20	500	1,000	2,500	5,000
30	750	1,500	3,750	7,500
40	1,000	2,000	5,000	10,000
50	1,250	2,500	6,250	12,500
60	1,500	3,000	7,500	15,000
70	1,750	3,500	8,750	17,500
80	2,000	4,000	10,000	20,000
90	2,250	4,500	11,250	22,500
100	2,500	5,000	12,500	25,000
110	2,750	5,500	13,750	27,500
120	3,000	6,000	15,000	30,000

Note. Ranges E and F, TV–7D/U.

21. Gas Test

Pushbuttons 4 — GAS 1 and 5 — GAS 2 are used when testing amplifier tubes for gas content. Multipurpose tubes are tested for gas only on the amplifier sections; the gas test does *not* apply to diode sections or to rectifier tubes. Allow tubes of the filament type to warm up before testing the tube for gas content.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the controls as indicated in the test data book.

c. Insert the tube in the proper test socket and set the POWER switch to ON.

d. Hold down pushbutton 4 — GAS 1 and adjust the BIAS control (fig. 6) until the meter pointer indicates 10 on the scale.

Note. If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob until the meter reading is 100.

e. Hold down pushbutton 4 — GAS 1 and press pushbutton 5 — GAS 2.

f. If the tube contains gas, the meter pointer will move up the scale. A movement of more than 1 division on the scale indicates a gassy tube.

g. Turn off the test set (par. 26).

22. Noise Test

The NOISE test jacks on either side of the SHORTS lamp (fig. 6) are used when testing electron tubes for noise. A radio receiver or an audio amplifier with a loudspeaker, and a set of test leads, are required to perform the test.

a. Perform the starting procedures (par. 17).

b. Set the controls for the tube under test as indicated in the test data book, and set the POWER switch to ON.

c. Set the FUNCTION SWITCH to SHORTS 1.

d. Connect a test lead to each of the NOISE jacks.

e. Connect the test lead from the left-hand NOISE jack to the chassis of the radio receiver or the audio amplifier.

f. Connect the test lead from the right-hand NOISE jack to either the antenna of a radio receiver or to the input of an audio amplifier. Turn the radio receiver or the audio amplifier power switch to the on position.

g. Tap the tube under test while the FUNCTION SWITCH is turned from position 1 through position 5.

h. Intermittent disturbances within the tube which are too brief to register on the SHORTS lamp will be reproduced as static by the loudspeaker.

i. Turn off the test set (par. 26).

23. Panel Lamp Test

The receptacle in the center of the large, 7-pin socket (fig. 7) is used to check panel lamps.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the FILAMENT selector switches to HR.

c. Set the FILAMENT VOLTAGE switch to the proper voltage for the lamp to be tested. If the exact voltage is not known, set the FILAMENT VOLTAGE switch to 0.6 volt and increase the voltage as required.

d. Insert the lamp in the receptacle and press the center contact of the lamp firmly against the bottom of the receptacle; then tilt the lamp until the metal shell makes contact with the rim of the receptacle. A defective lamp will not light.

e. Turn off the test set (par. 26).

24. Testing Special Tube Types

a. Special Testing Procedures. Certain electron tubes, such as the 6CD7, 6DA5, 6360, and 6524, require a special testing procedure. The 1-megohm resistors required to test the 6CD7 and the 6DA5, and the 30-volt battery required to test the 6360 and the 6524, are not supplied with the test set. The selectors are set for the tube under test in the normal manner. However, *before* the POWER switch is set to the ON position, the resistors or the battery is connected to the test socket pins as directed in the test data book.

Caution: **Disconnect the 30-volt battery *before* resetting any of the selector switches.**

b. Voltage Regulators. When voltage regulator tubes are tested, sufficient voltage must be applied to ionize the gas and to cause the voltage regulator tube to conduct. Refer to the test data book for the proper use of the pushbuttons and for control settings.

c. Thyratrons. To test thyratrons, set the controls as indicated in the test data book. Press the proper pushbutton and adjust the BIAS control until the tube strikes; this is indicated by a glow between the tube elements and a sharp rise of the meter pointer. The limits of the bias voltage between which the tubes should strike are shown in the test data book. After the tube strikes, the condition of the tube is read on the meter.

d. Tuning Eye Tubes. Set the controls as indicated in the test data book. When the proper pushbutton is depressed, note the effect on the tuning eye and compare it to the data in the *Notations* column. When the eye is closed, a thin, bright line is observed; when the eye is open, a wide, dark area is observed.

25. Testing Subminiature Tubes

Subminiature tubes are tested in SUB. MIN. sockets X109 and X110 (fig. 9).

a. Subminiature tubes of the round type with short wire leads or pins are tested in special socket X110. This circular socket has eight contacts.

(1) Several basing arrangements (fig. 10) are used for these tubes. The arrows near several of the tube bases in figure 10 indicate the location of the dot on the base of the tube. Check the *Notations* column in the test data book; examine the tube and identify the basing. Use adapter E104 (par. 16*a*) when the subminiature tube has long leads.

(2) Insert the leads or pins in the corresponding contacts of socket X110. If the leads are long enough, set the POWER switch to the OFF position, grasp each lead about one-eighth inch from its end with the tips of a pair of long-nosed pliers, and insert the leads into the proper socket contacts. Set the POWER switch to the ON position and test the tube.

b. Subminiature tubes of the flat or in-line-contact type with pins or leads are tested in flat socket X109 (fig. 9). The tube pins or leads must be inserted so that the dot on the base of the tube is directly in line with the small, molded dot on the socket.

c. Subminiature tube types are identified in the test data book by a star beside the type number. The applicable basing for the various round types is indicated in the *Notations* column. The basing designation letter refers to the diagrams shown in figure 10.

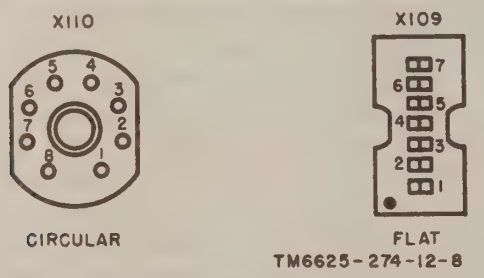

Figure 9. Top view of sockets X109 (flat) and X110 (circular).

26. Stopping Procedure

a. Set the POWER switch to the OFF position.

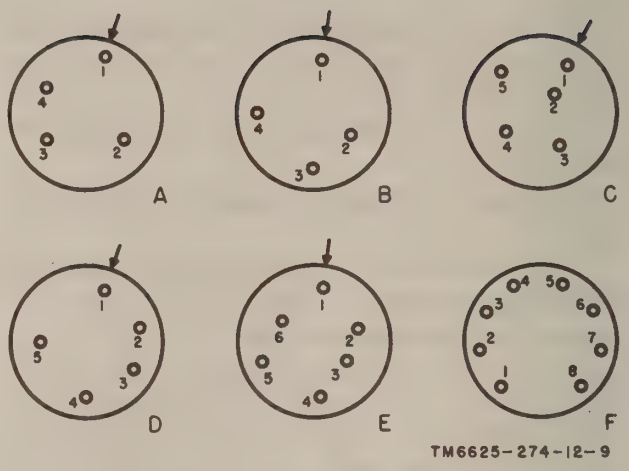

Figure 10. Basing diagrams for subminiature tubes (letters, A, B, C, D, E, and F identify basing for use with test data book).

b. Remove the tube under test from the test socket.

c. Place the adapters, if used, under the clamps on the inside of the cover.

d. Disconnect the ac line cord from the power source and wind it counterclockwise around the retainer bracket on the inside of the cover. Secure the plug under the storage clip (TV-7B/U and TV-7D/U, fig. 3 and 4), or under the coiled ac line cord (TV-7/U and TV-7A/U).

e. Place the test leads, if used, in the storage clips (not on TV-7/U). On the TV-7/U, store the test leads under the coiled ac line cord or as shown in figure 1.

f. Close the cover and secure the fasteners.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

27. General

The test set is designed for normal operation through a temperature range from —40° F to +125°F. The operation of the equipment may be more difficult in regions where extreme cold, heat, humidity, or moisture conditions prevail. Paragraphs 28 through 30 provide operational information that may be used to minimize the effects of regional extremes.

28. Operation at Low Temperatures

Subzero temperatures and climatic conditions associated with cold weather may effect the efficient operation of the test set.

a. Extreme cold makes the ac line cord and other rubber parts stiff and brittle. Handle the equipment carefully to avoid cracking the insulation on the ac line cord and on the test leads.

b. Keep the equipment in a warm, dry location. If possible, keep the test set in a heated enclosure. A standby heater is not provided; therefore, leave the test set turned on if possible.

c. Allow the test set to warm up for 10 to 15 minutes before testing tubes. The length of warmup time depends upon the temperature of the surrounding air.

d. If equipment that has been exposed to the cold is brought into a warm room, moisture will form on it and may cause fogging of the meter glass. Dry the equipment thoroughly.

e. Keep the cover of the test set closed at all times when the equipment is not in operation. This will prevent an accumulation of moisture within the equipment due to sweating.

29. Operation Under Tropical Conditions

Warm, damp climates expose the equipment to damage from moisture and fungus. The high relative humidity causes condensation when the temperature of the equipment drops below that of the surrounding air. Adequate ventilation will minimize this condition. Keep the cover of the test set closed as much as possible. Wipe all moisture and fungus from the exterior of the test set with a clean, lint-free cloth.

30. Operation in Desert Climates

Desert climates expose the test set to damage from dirt, dust, sand, and the effects of strong sunlight. Provide means for keeping dust and sand from entering the holes in the test sockets, adapters, and jacks, and from accumulating around the pushbuttons and other moving parts of the test set. Clean and dust the equipment frequently. When not in use, keep the cover closed to keep dust and dirt out of the exposed parts.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

31. General

The procedures in paragraphs 33 through 39 are to be performed by the operator or organizational maintenance personnel. Operator's maintenance consists of preventive maintenance (par. 33), visual inspection (par. 34), and replacement of electron tubes (par. 37) and lamps (par. 39). Organizational maintenance of the test set is limited to preventive maintenance (par. 33) and to the replacement of the adapters (fig. 8), knobs and pushbuttons, indicator light lens, cable clamps, and clip insulators. The only tools required are those tools normally available to the repairman-user because of his assigned mission.

32. Materials Required

The materials required for operator's and organizational maintenance are as follows:

a. Cleaning compound (Federal stock No. 7930-395-9542).

b. Cleaning cloth.

c. Sandpaper, #0000.

33. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 11 and 12) is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items not applicable to the test set are lined out in figure 12. References in the ITEM block in figure 12 are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the form.

b. Items. The information shown below supplements DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the case, the front panel, and the adapters. If necessary, wet a cloth with cleaning compound and then wipe the parts with a dry, clean cloth.
2	Inspect the clips that hold the adapters and the clips that hold the test leads (TV-7B/U and TV-7D/U) for tight spring action. Check the ring binder for proper operation. Check the PILOT, FUSE, and SHORTS lamps for broken glass. Check to see that the socket-saver adapters (fig. 7) are tightly secured in their respective test sockets.

***Warning*: Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.**

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE: TEST SET, ELECTRON TUBE TV-7D/U

EQUIPMENT SERIAL NUMBER: 2404

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelom
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		8 FEB '60	Harold Andrews
	✓	22 FEB '60	James Drake

U. S. GOVERNMENT PRINTING OFFICE: 1957 O—427138

DA FORM 1 MAY 57 11-266

Figure 11. DA Form 11-266, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF FEBRUARY 1960

NO.	DAILY ITEM	1 HA 17	2 HA 18	3 HA 19	4 HA 20	5 HA 21	6 HA 22	7 HA 23	8 HA 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, ~~CASES, CABINETS, CONTROL PANELS, INTER-CONNECTING PLUGS,~~ CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PAR. 31b	✓	✓	✓	✓	✓	✓	✓	✓									✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, ~~CONNECTORS~~ AND PILOT LIGHTS. PAR. 31b	✓	✓	✓	✓	✓	(X)	✓	✓									✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS.	✓	✓	✓	✓	✓	-	✓	✓									✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓									✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE ~~AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PAR. 9d	✓					✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE LO LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS~~, FUSES, ~~CONNECTORS, PLUG-IN COILS~~, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. ~~INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREW-TYPE~~ TERMINALS OF TRANSFORMERS, FIXED CAPACITORS, RESISTORS, ~~CHOKES~~, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES~~; CLEAN INTERIOR OF CHASSIS AND CABINETS.	✓
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. ~~INSPECT CATHODE-RAY TUBES FOR BURNED SCREEN SPOTS.~~	
28. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. METER GLASS BROKEN.
REPORTED TO HIGHER ECHELON
MAINTENANCE FOR REPLACEMENT.

2 3

Figure 12. DA Form 11-266, pages 2 and 3.

TM6625-274-12-11

34. Visual Inspection

a. When the equipment fails to perform properly, check the items listed below.

(1) Test leads, if used, poorly connected or improperly connected.
(2) Incorrect pushbutton depressed.
(3) Improper setting of selector switches or controls (par. 18*b*(3)).
(4) Battery or resistors improperly connected (par. 24*a*).
(5) FUSE lamp defective.
(6) LINE ADJUST control improperly adjusted (par. 17*c*).

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (par. 35).

35. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the operator or the organizational maintenance man can perform are given in the *Corrective measures* column. When using the checklist, start at step 1 and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken. Perform the steps in *b* below.

b. Checklist.

	Step	Item	Action or condition	Normal indication	Corrective measures
PREPARATORY	1	Ac line cord.	Connect ac line cord to power source.		
	2	POWER switch.	Set switch to ON position.	PILOT lamp lights.	Check ac line cord connection. Remove (par. 39*a*) and check (par. 23) PILOT lamp; replace if defective. Remove (par. 39*a*) and check (par. 23) FUSE lamp; replace if defective. Higher echelon repair required.
	3	Meter.		Pointer stays at zero.	Defective type 86 tube; replace tube (par. 37) .
	4	Pushbutton 1—LINE ADJ.	Depress pushbutton.	Meter pointer moves up-scale.	Higher echelon repair required.
	5	LINE ADJUST control knob.	Rotate control knob, while holding pushbutton 1—LINE ADJ. down, until meter pointer is directly over LINE TEST mark.	Meter pointer moves when control knob is turned.	Check for low-line voltage if pointer will not adjust properly. Higher echelon repair required.
	6	Selectors.	Set selectors as directed in paragraph 17*e*(1).	Selector knobs should be tight and point directly at a number or letter. The switch detents should be positive.	When a selector pointer is between two numbers or two letters, rotate switch fully counterclockwise. Loosen knob setscrew, turn knob until it points directly at the first number or letter, and tighten setscrew. Tighten loose knobs. If switch detents are not positive, higher echelon repair is required.
	7	FUNCTION SWITCH.	Rotate switch through the five SHORTS positions.	SHORTS lamp glows at positions 2 and 3 of switch.	Check switch settings. Replace SHORTS lamp (par. 39*b*). Higher echelon repair required.
	8	POWER switch.	Set switch to OFF position.	PILOT lamp goes out.	

	Step	Item	Action or condition	Normal indication	Corrective measures
START	9	Selectors and controls.	Set according to test being performed.		
	10	Tube under test.	Insert in proper test socket. Make connections as required.	Tube pins enter test socket without forcing.	Check for bent pins. Straighten pins of miniature tubes in one of the pin straighteners.
	11	POWER switch.	Set switch to ON position.	PILOT lamp lights.	
EQUIPMENT PERFORMANCE	12	Meter.	Checking tube for dynamic mutual conductance, emission, or gas.	Meter pointer indicates condition of tube under test when proper pushbutton is depressed.	If meter pointer stays at zero, tube under test may be defective. Check setting of selectors and controls. Test another tube. Higher echelon repair required.
	13	BIAS control.	Gas test.	Meter pointer can be adjusted to 10 by turning control knob.	Adjust BIAS control knob until pointer indicates 100, then proceed with gas test.
	14	Panel lamp test socket.	Checking a panel (pilot) lamp (par. 23).	A good lamp will light.	Make good contact between lamp and test socket. Check control settings. Lamp may be defective; check other lamps if available. Higher echelon repair required.
	15	Adapter E104 (fig. 8).	Testing long lead subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Unsnap locking device on adapter, move tube up and down to check seating of leads, and secure locking device. Test tube again. Check control settings. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Replace adapter and check tube again. If meter pointer does not move when correct pushbutton is depressed, test another tube. Higher echelon repair required.
	16	Adapter E105 (fig. 8).	Testing tube type 3E29, 829-B, or 832-A.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of adapter and tube. Check plate lead for a good connection. Check setting of controls. Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	17	Adapter E107 (fig. 8).	Testing tube type 2C39.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of tube and adapter. Remove adapter and tube and squeeze spring contacts closer together if necessary. Check setting of controls. Replace adapter and tube in test socket and test tube again.

	Step	Item	Action or condition	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE					Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	18	Socket X109 (fig. 9).	Testing flat subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Check to see that dot on base of tube is aligned with dot on test socket. Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Test another tube. Higher echelon repair required.
	19	Socket X110 (fig. 9).	Testing round subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Test another tube. Higher echelon repair required.
STOP	20	Tube under test.	Remove from test socket.		
	21	POWER switch.	Set to OFF position.	PILOT lamp goes out.	
	22	Ac line cord.	Remove ac line cord plug from power source.		

36. Removal of Chassis

a. Removal.

(1) Unsnap the latches and open the cover of the test set.

(2) Unwind the ac line cord from the retainer bracket and remove the cover from the test set. Remove the cover by sliding it to one side until the hinge pins are disengaged.

(3) Remove the screws that secure the front panel to the case.

(4) Hold the front panel to the case, turn the test set over, and gently place it on a clean, flat surface.

(5) Slowly lift the test set case upward until it is clear of the chassis.

b. Replacement.

(1) Position the test set case so that the handle is forward.

(2) Carefully lower the test set into the case. Be sure that no wires are caught between the front panel and the edge of the case.

(3) Replace the screws that secure the front panel to the case. Tighten the screws in rotation a little at a time to prevent binding.

(4) Replace the cover on the case, wind the ac line cord counterclockwise on the retainer bracket, secure the plug under the clip (not on TV–7/U), close the cover, and secure the latches.

37. Tube Replacement

When trouble occurs, check the ac line cord connection and the control settings before removing any tubes. If tube failure is suspected, use the tube substitution method (*a* below) to check the tubes.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.**

a. Tube Substitution Method. Replace a suspected tube (*b* below) with a new tube. If the equipment still does not work, remove the new tube and put back the original tube. Repeat this procedure with the other tube. If the test set is still inoperative, other checks are required (par. 35*b*).

b. Replacing Tubes in Test Set, Electron Tube TV-7(*)/U. Check the tubes in the test set as follows:

(1) Remove the chassis from the case (par. 36*a*).

(2) Remove the tube clamp (fig. 13) from the threaded stud and remove the tube.

Caution: **Be careful not to hit the meter case with tube type 83 when removing the tube.**

(3) Replace the tube (*a* above) with one of the running spares.

(4) Set the tube (or a replacement) in the socket and secure it with the tube clamp.

(5) Replace the chassis in the case (par. 36*b*).

38. Preferred-Type Tubes

A preferred-type electron tube, type 5Y3WGTA, has been developed as a direct replacement for nonpreferred types 5Y3GT and 5Y3WGT (par. 7). The 5Y3WGTA is used in the power supply. When replacement of a 5Y3GT or a 5Y3WGT is necessary, replace it with a 5Y3WGTA. Do not substitute a 5Y3GT or a 5Y3WGT for a 5Y3WGTA.

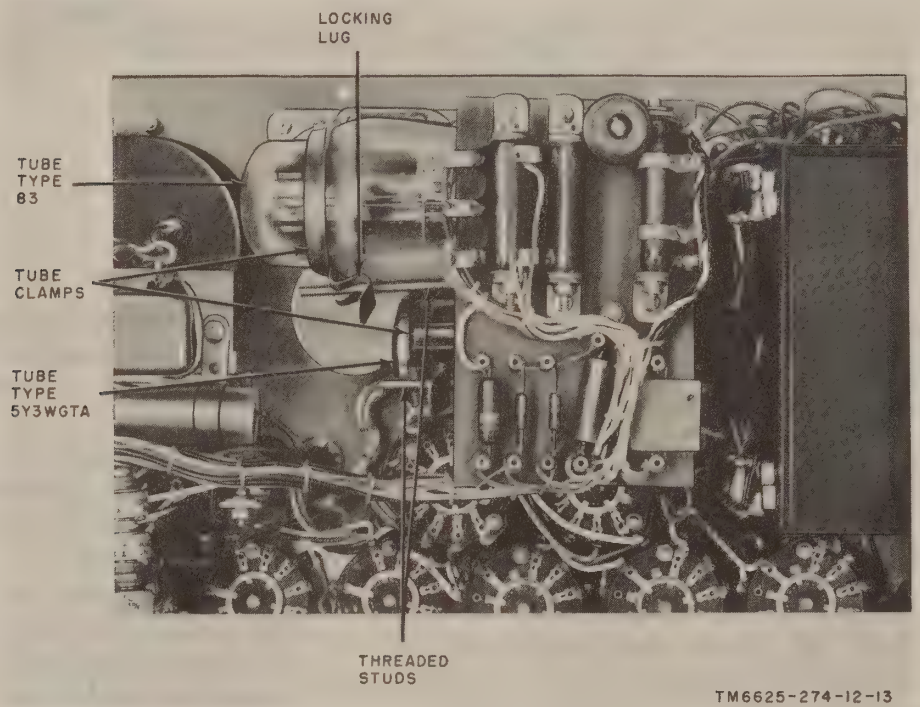

Figure 13. Tube location.

39. Replacement of Lamps

The FUSE, PILOT, and SHORTS lamps are removable from the front panel of the test set.

a. The FUSE lamp and PILOT lamp have bayonet-type bases. Unscrew and remove the PILOT lamp indicator jewel to gain access to the PILOT lamp. To remove either lamp, press downward, turn the lamp to the left, and lift straight up. To replace the FUSE or PILOT

lamp, insert the lamp in the appropriate socket, press downward, turn the lamp to the right, and release it. Replace the PILOT lamp indicator jewel.

b. The SHORTS lamp has a screw-type base. Remove the lamp by turning it to the left; replace the lamp by turning it to the right.

CHAPTER 4
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

40. Removal From Service

a. Set the POWER switch to the OFF position and disconnect the test set from the power source.

b. Place the adapters under the clamps on the cover.

c. Wind the ac line cord counterclockwise around the retainer bracket and place the plug under the clip (not on TV-7/U). Place the test leads under the coiled ac line cord (TV-7/U and TV-7A/U) or as shown in figures 1 and 2. On the TV-7B/U and the TV-7D/U, insert one end of the test leads into the storage clips and connect the alligator clips to the studs (fig. 3 and 4).

d. Close the cover and secure it with the latches.

41. Repackaging for Shipment or Limited Storage

(fig. 14)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 8) will also be helpful.

a. Material Requirements. The following materials are required for repackaging Test Set, Electron Tube TV-7(*)/U. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Flexible corrugated fiberboard	10 sq ft
Waterproof wrapping paper	10 sq ft
Gummed paper tape	3 ft
Pressure-sensitive tape	4 ft
Metal strapping (⅝- by 0.020-inch) (*Note.* Strapping seals required)	8 ft
Wooden box (inside dimensions: 18⅝ by 10¼-by 7⅞-inch)	1 ea (9 bd ft)

b. Packaging.

(1) *Technical manual.* Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the seams with pressure-sensitive tape.

(2) *Spare parts.* Wrap each part within a layer of flexible corrugated fiberboard. Seal the seams with gummed paper tape. Overwrap the flexible corrugated fiberboard with waterproof wrapping paper and seal with pressure-sensitive tape.

(3) *Test set.* The procedure used to package the test set is the same as the procedure used to package the spare parts ((2) above).

c. Packing.

(1) Fabricate a wooden box.

(2) Place the packaged test set (*b*(3) above) in the wooden box.

(3) Place the spare parts (*b*(2) above) and the technical manuals on top of the test set.

(4) Nail down the wooden cover.

(5) Strap the wooden box when intertheater shipment is involved.

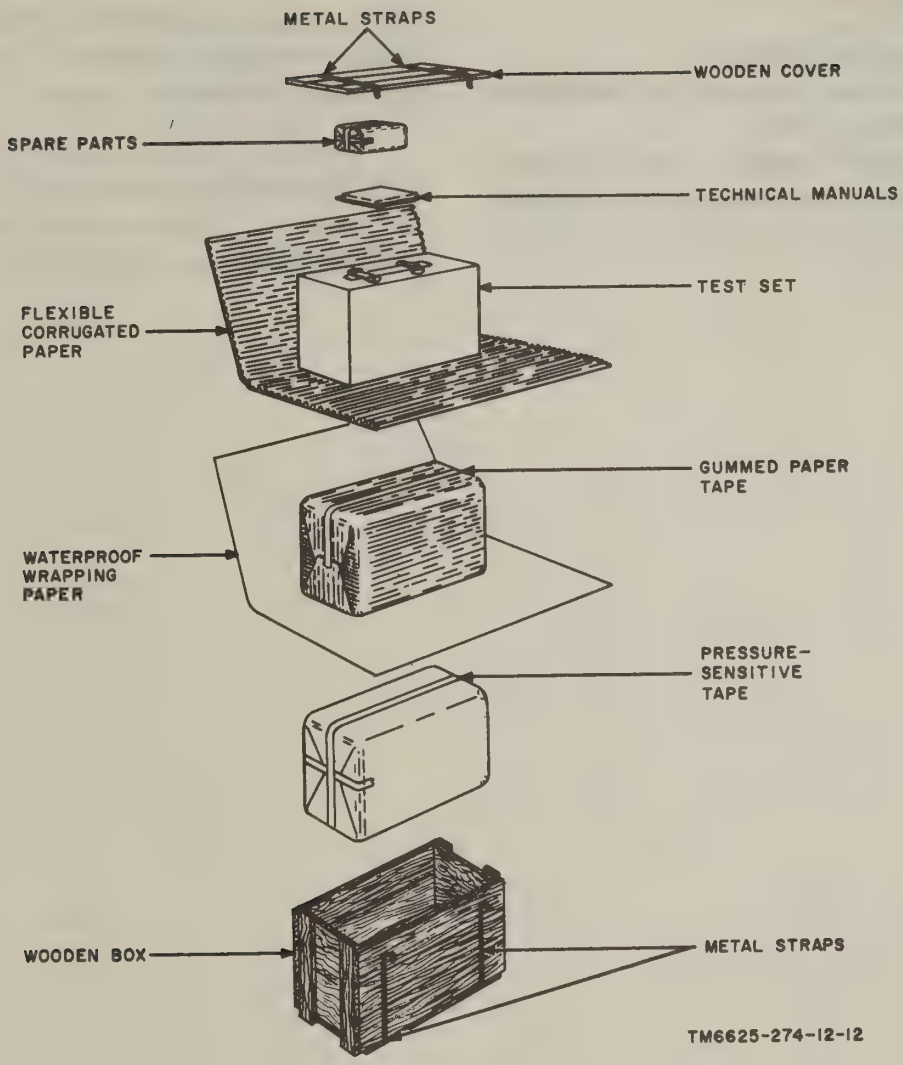

Figure 14. Field repackaging diagram.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

42. Authority for Demolition

The destruction procedures outlined in paragraph 43 will be used to prevent further use of the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

43. Methods of Destruction

Any or all of the methods of destruction given below may be used.

a. Smash. Use sledges, axes, hammers, crowbars, or any other heavy tools available; smash the case, cover, adapters, front panel, and meter.

b. Cut. Use axes, handaxes, machetes, or knives; cut the ac line cord and test leads.

c. Burn. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades; burn the technical manuals and test data book.

Warning: **Be extremely careful with explosive and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use grenades, TNT, or firearms, if explosives are necessary.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways.

APPENDIX I
REFERENCES

Following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U:

SB 38-100	Preservation, Packaging and Packing Materials, Supplies and Equipment Used by the Army
TB 11-5083-1	Tube Test Data for Electron Tube Test Sets TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U

APPENDIX II
OPERATOR'S MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope

a. General. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part* of the major item, and all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns. The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* A dagger (†) indicates the model in which the part is used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustrations (Figure No.).* The numbers in this column refer to the illustration or illustrations where the part is shown.

(9) *Illustrations (Item No.).* This column lists the reference symbols used for identification of items in the illustrations or text of the manual.

2. Critical Items

A zero slash (0) in the "Description" column indicates items that are expected to fail during the first year; also items that will make the equipment inoperative if they fail.

Section II. FIRST ECHELON FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL 1	2	3	4	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS FIGURE NO.	(8) ITEM NO.
						ITEMS COMPRISING AN OPERABLE EQUIPMENT					
						TEST SET, ELECTRON TV-7/U; TV-7/A,B,D/U					
						NOTE: Model Column 1 refers to TV-7/U; Column 2 refers to TV-7A/U; Column 3 refers to TV-7B/U; Column 4 refers to TV-7D/U					
	6625-376-4939					TEST SET, ELECTRON TV-7/U; TV-7A,B,D/U:	ea	NX		1,2,3,4	
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM 11-6625-274-12P:	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL BULLETIN TB-11-5033-1	ea	X	2		
	Order thru AGC	†	†	†	†	TECHNICAL MANUAL TM11-5083	ea	X	2		
	5935-204-8379	†	†	†	†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-B-179212	ea	X	1	8	E104
	5935-201-8500	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-33	ea	X	1	8	E105
	5935-537-4056		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-C-179260	ea	X	1	8	E105
	5935-502-1777	†		†		ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-50	ea	X	1	8	E107
	5935-511-6491		†		†	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SM-B-179230	ea	X	1	8	E107
	6625-684-1189	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X3B	ea	X	1	4	X3B
	6625-618-9928	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X7B	ea	X	1	4	X7B
	6625-618-9929	†	†	†	†	ADAPTER, TEST: Victoreen Inst Co part 795-X10B	ea	X	1	4	X10B
	6625-586-8349			†		COVER, TEST SET: Hickok part No. 3145-333	ea	X	1	3	
	6625-668-4683	†	†	†	†	LEAD, TEST: Hickok part No. 12450-245	ea	X	2	1,2,3,4	W101 W102
						RUNNING SPARES AND ACCESSORY ITEMS					
						TEST SET, ELECTRON TV-7/U; TV-7A,B,D/U					
	5960-262-0218	†	†	†	†	6 ELECTRON TUBE: MIL type 5Y3WGTA	ea	X	1	15	V102
	5960-100-7323	†	†	†	†	6 ELECTRON TUBE: MIL type 83	ea	X	1	15	V101
	6240-179-1814	†	†	†	†	6 LAMP, GLOW: GE part No. NE-45	ea	X	1	15	E101
	6240-014-2306	†	†	†	†	6 LAMP, INCANDESCENT: GE part No. 81	ea	X	1	15	E103
	6240-155-8706	†	†	†	†	6 LAMP, INCANDESCENT: GE part No. 47	ea	X	1	15	E102

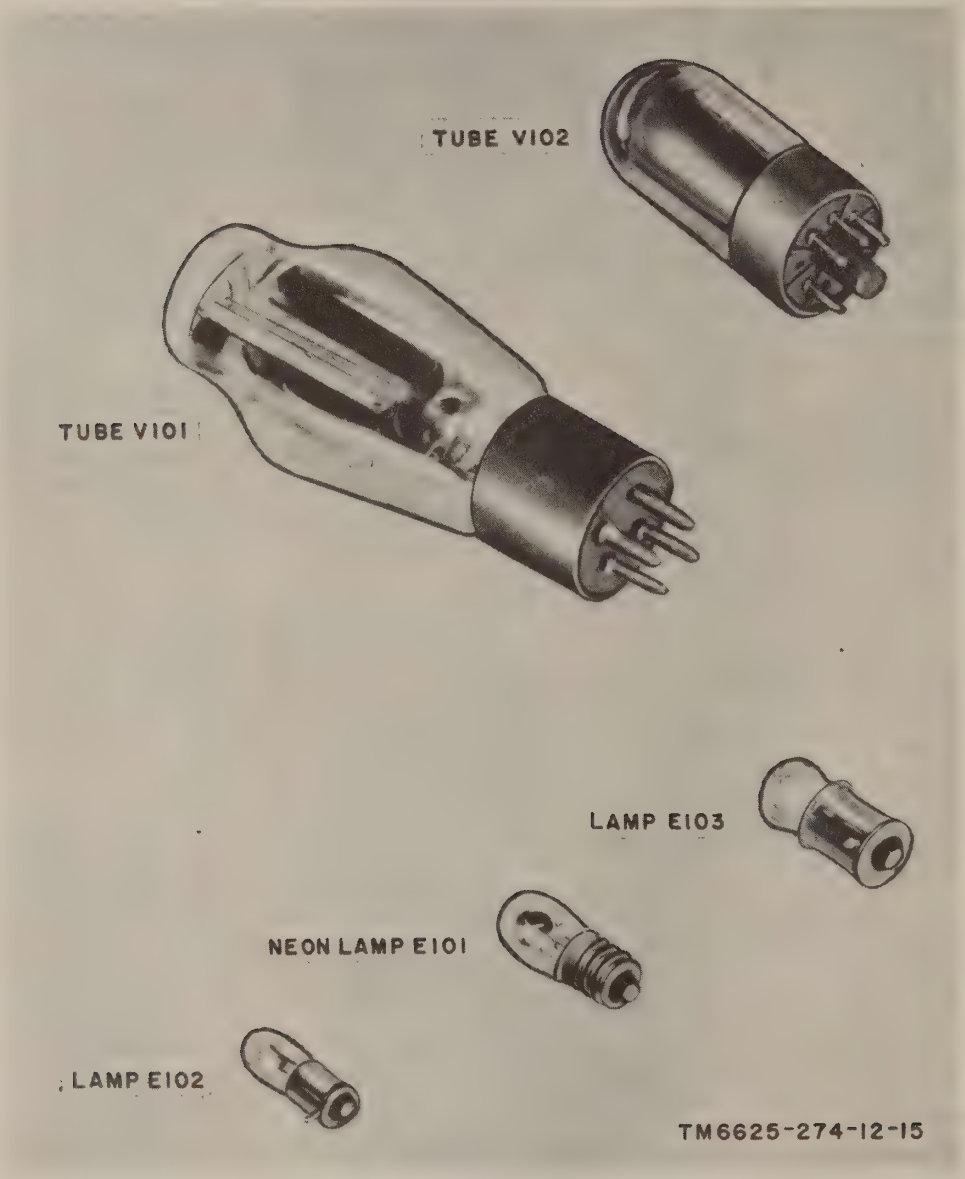

Figure 15. Electron tubes and lamps.

APPENDIX III
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. Scope

a. General. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Allocation of Maintenance Functions. Columns in section II, Allocation of Maintenance Functions, are defined as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(h) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation. Column 5 is not used.

(4) *Tools required.* This column indicates the tool, test, and maintenance equipments required to perform the maintenance functions. These numbers are identified in section III, Allocation of Tools for Maintenance Functions.

(5) *Remarks.* This column contains any notations necessary to clarify the data cited in the preceding columns.

c. Allocation of Tools for Maintenance Functions. Columns in section III, Allocation of Tools for Maintenance Functions, are as follows:

(1) *Tools required for maintenance functions.* This column lists the tools and test equipment required to perform the maintenance functions.

(2) *1st, 2nd, 3rd, 4th, and 5th echelon.* A dagger (†) in columns 3, 5, and 6 indicates that the tool or test equipment is allocated to that echelon. Columns 2 and 4 are not used.

(3) *Tool code.* This column lists the tool code assigned. The numbers are used

in the maintenance allocation chart to refer to the indicated item.

(4) *Remarks.* Not used.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, and clamps.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	
ADAPTER, TUBE SOCKET	replace		X					
	repair				X			
BINDER, LOOSE LEAF	replace				X			
BUTTON, PUSH	replace				X		5	
BUMPER, RUBBER	replace				X			
INSULATOR, CLIP	replace		X					
CABLE, POWER, ELECTRICAL	replace				X			
CAPACITOR	replace				X		5	
CASE (2) ELECTRICAL EQUIP CABINET	replace					X	5	
	repair					X	5	
CATCH, LUGGAGE	replace				X		5	
HANDLE, LUGGAGE	replace				X		5	
CLAMP, ELECTRICAL	replace		X					
CONNECTOR	replace				X		5	
DIAL CONTROL	replace				X			
	repair				X			
ELECTRON TUBE	replace	X						

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TV-7/U; TV-7A,B,D/U (continued)								
GASKET, RUBBER	replace				X		5	
	rebuild					X	5	
GROMMET, RUBBER	replace				X		5	
HINGE, BUTT	replace				X		5	
KNOB	replace		X					
LAMP, GLOW	replace	X						
LAMP, INCANDESCENT	replace	X						
LAMPHOLDER	replace				X		5	
LIGHT INDICATOR	replace				X		5	
LENS, INDICATOR LIGHT	replace		X					
LEAD, TEST	replace				X			
	rebuild				X		5	
CLIP, ELECTRICAL	replace				X		5	
JACK, TIP	replace				X		5	
METER, ELECTRON TUBE TESTER	replace				X		5	
	repair					X	5	
RECTIFIER, METALLIC	replace				X		5	
RESISTOR	replace				X		5	
RETAINER, ELECTRON TUBE	replace				X		5	
SOCKET, ELECTRON TUBE	replace				X		5	
STRAIGHTENER, PIN	replace					X		
STUD, THREADED	replace				X			
SWITCH	replace				X		5	
TERMINAL, STUD	replace				X		5	
TRANSFORMER, POWER	replace				X		5	

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH	(3) 2ND ECH	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
TV-7/U; TV-7A, B, D/U							
MULTIMETER TS-352/U				†	†	1	
RESISTOR, DECADE ZM-16/U				†	†	2	
TEST SET, ELECTRON TUBE TV-7/U				†		3	
TEST SET, ELECTRON TUBE TV-2/U					†	4	
TOOL EQUIPMENT TE-113				†	†	5	
TRANSFORMER, VARIABLE CN-16/U				†	†	6	
VOLTMETER, METER ME-30/U				†	†	7	
TOOL AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				8	

By Order of *Wilber M. Brucker*, Secretary of the Army:

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NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.

USAR: None

For explanation of abbreviations used, see AR 320–50.

U.S.GOVERNMENT PRINTING OFFICE:1974-557-671

PACKING LIST

PACKED BY
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SACRAMENTO, CA 95813

1

2A. ORDER NO.
SAAD C/N A5941

3. END ITEM
6625-00-820-0064
TEST SET, TV-7D/U
BILI # FEM DTD: 9054

4. DATE
23 JULY 1980

5. PAGE 1 OF 1 PAGES

BOX NO. (a)	CONTENTS - STOCK NUMBER AND NOMENCLATURE (b)	UNIT OF ISSUE (c)	QUANTITIES REQUIRED: INITIAL OPERATION (d)	QUANTITIES REQUIRED: RUNNING SPARES (e)	QUANTITIES REQUIRED: TOTAL (f)
	6625-00-618-9928 ADAPTER, MOUNTED (X78) SMB_425639	EA	1		1
	6625-00-618-9928 ADAPTER, MOUNTED, SM-B-425640(x10B)	EA	1		1
	6625-00-684-1189 ADAPTER, MOUNTED (X3B) SM-B-425638	EA	1		1
	ASSORTED ITEMS KIT CONSISTS OF:				
	6625-00-727-7065 TEST LEAD, W101, W102	EA	2		2
	5935-00-283-3399 ADAPTER, (E104)	EA	1		1
	5935-00-305-1189 ADAPTER, (E107)	EA	1		1
	5935-00-537-4056 ADAPTER, (E105)	EA	1		1
	6625-00-069-1960 ADAPTER, P/N # 86-060	EA	1		1
	6625-00-808-1802 ADAPTER, P/N # 1050-127	EA	1		1
	TM11-6625-274-12 W/C 2,4,5	EA	1		1
	TB11-6625-274-12-1	EA	1		1

6. THIS CERTIFIES THAT ITEMS LISTED HEREON ARE WITHIN THE SPECIFIED BOXES

TYPED NAME AND TITLE
RANGEL, MAT'L SORTER AND CLASSIFIER

SIGNATURE
Rangel

DD FORM 1750

NOTES TO CONSIGNEE

The listing shown on the reverse side, together with pertinent notations relative to each item included, is furnished for your information and guidance only. In the case of lists covering equipment sets, one copy may be retained for reference and used as a supporting document to property books and the other copy retained with the equipment as a component parts listing. For the purpose of clarification, explanations of the various entries on this Packing List are furnished.

ITEM 1. The number of boxes in a set.

ITEMS 2*a.* & *b.* The requisition number appearing on the DD Form 1348-1 or order number will be indicated in this entry. The number so referenced should be cited in any correspondence regarding this shipment.

ITEM 3. The stock number, nomenclature, type number *(when available)*, and the directive under which the end item was assembled. Not applicable to shipments consisting only of miscellaneous repair parts and accessories for the assembly, set or unit in which case this entry will contain such a notation in lieu of the information cited above *(See 5.3.1.1)*.

ITEM 4. Date of preparation.

ITEM 5. Self-explanatory.

Column a. This column will be used when two or more boxes are required for the equipment. It will indicate the number of the container in which the items are packed.

Column b. This space contains a listing of items contained within the box, which are identified by stock number and nomenclature. When an FSN is not applicable, the manufacturer's code *(See 5.2.2.10)* and part number shall be used.

> *NOTE: As required, due to out of stock position within the DOD supply system, a component parts shortage which will not hinder operational functions may be waived by higher authority and will be so indicated to the right of the nomenclature. Waivers noted thereon should be requisitioned through normal supply channels.*

Column c. Self-explanatory.

Column d. "Initial Operation" - Items which are required for operation of the equipment.

Column e. "Running Spares" - Those items shipped concurrently with the equipment as spare parts and accessories.

> *NOTE: Columns d and e will be used on an optional basis.*

"Total" - Self-explanatory.

ITEM 6. Self-explanatory.

☆ G.P.O.: 1979-691-673 / 236

TM 11-6625-274-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL
MAINTENANCE MANUAL

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U AND TV-7D/U

JUNE 1960

TECHNICAL MANUAL
No. 11-6625-274-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *14 June 1960*

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

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*This manual supersedes so much of TM 11-5083, 29 September 1953, including C1, 2 September 1955; C2, 8 February 1956, and C3, 1 April 1959, as pertains to operation and organizational maintenance; so much of C4, 26 August 1959, as pertains to packaging and repackaging; TM 11-6625-274-10P, 11 June 1959, and so much of TM 11-6625-274-20P, 11 June 1959, as pertains to the maintenance allocation chart.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Test Sets, Electron Tube TV-7/U (fig. 1), TV-7A/U (fig. 2), TV-7B/U (fig. 3), and TV-7D/U (fig. 4), and covers installation, operation, and first and second echelon maintenance. It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to first and second echelon maintenance personnel.

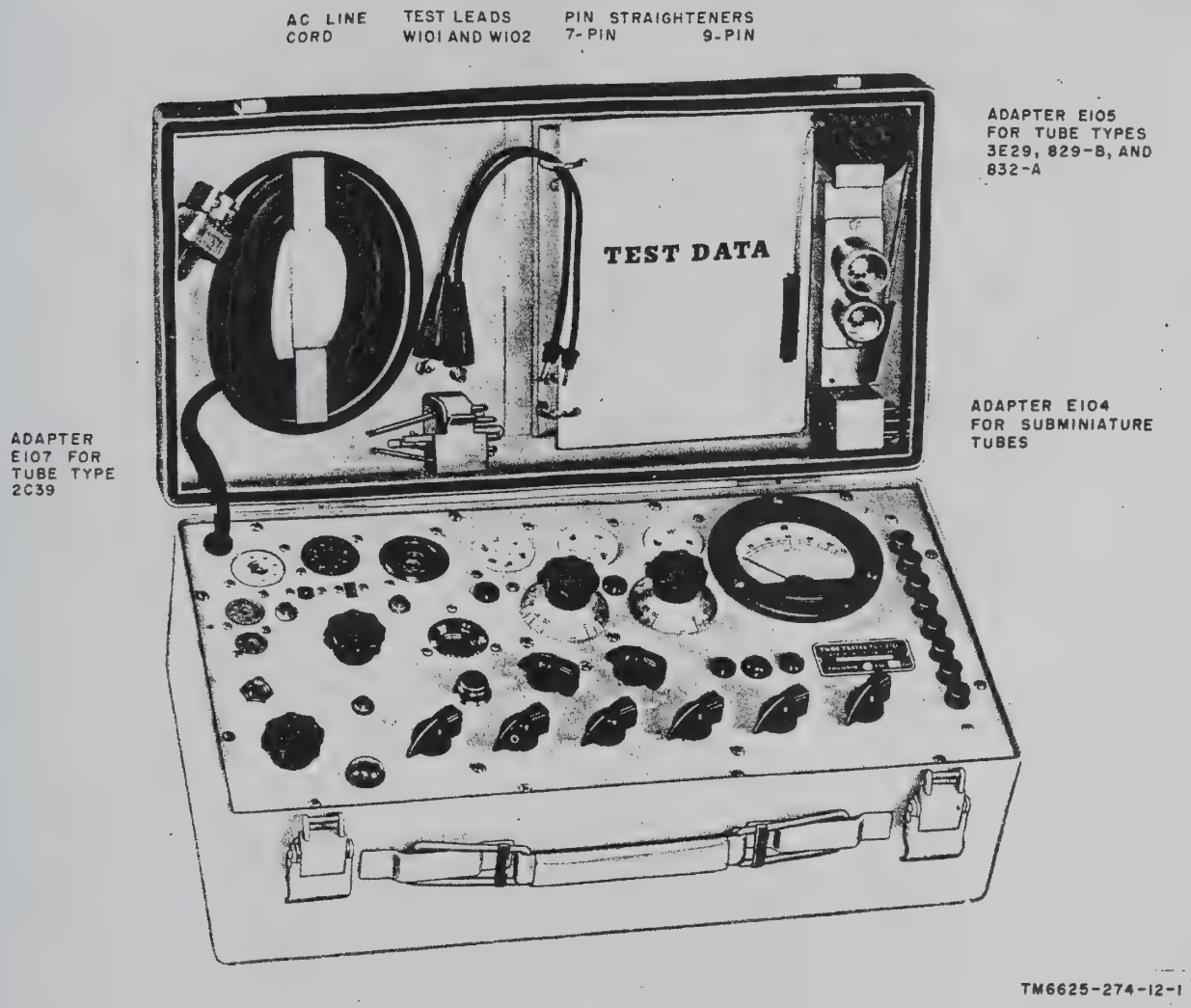

Figure 1. Test Set, Electron Tube TV-7/U, less running spares.

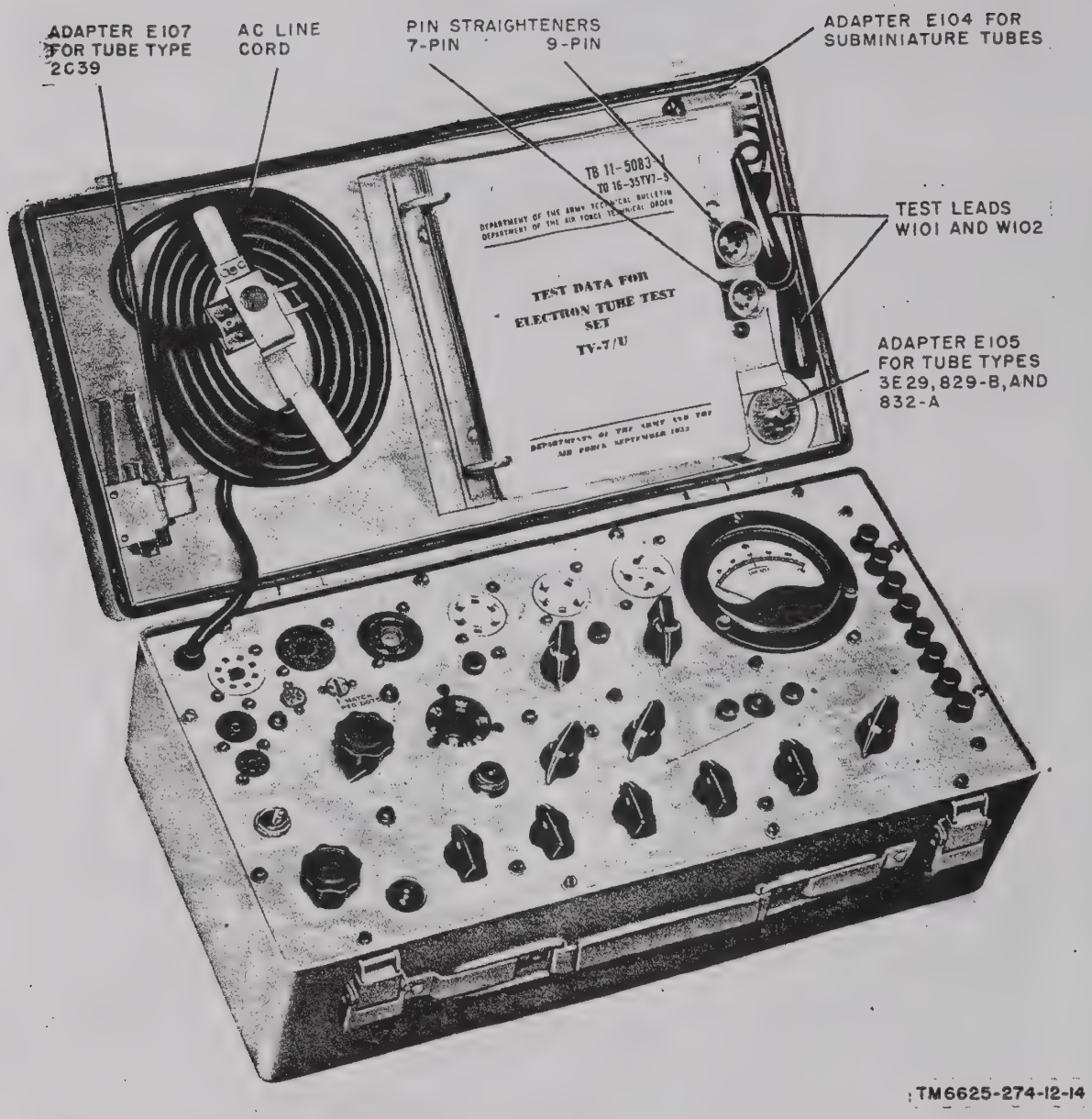
ADAPTER E107 FOR TUBE TYPE 2C39
AC LINE CORD
PIN STRAIGHTENERS 7-PIN 9-PIN
ADAPTER E104 FOR SUBMINIATURE TUBES
TB 11-5083-1 TO 16-35TV7-3
TEST LEADS W101 AND W102
TEST DATA FOR ELECTRON TUBE TEST SET TV-7/U
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TM6625-274-12-14

Figure 2. Test Set, Electron Tube TV–7A/U, less running spares.

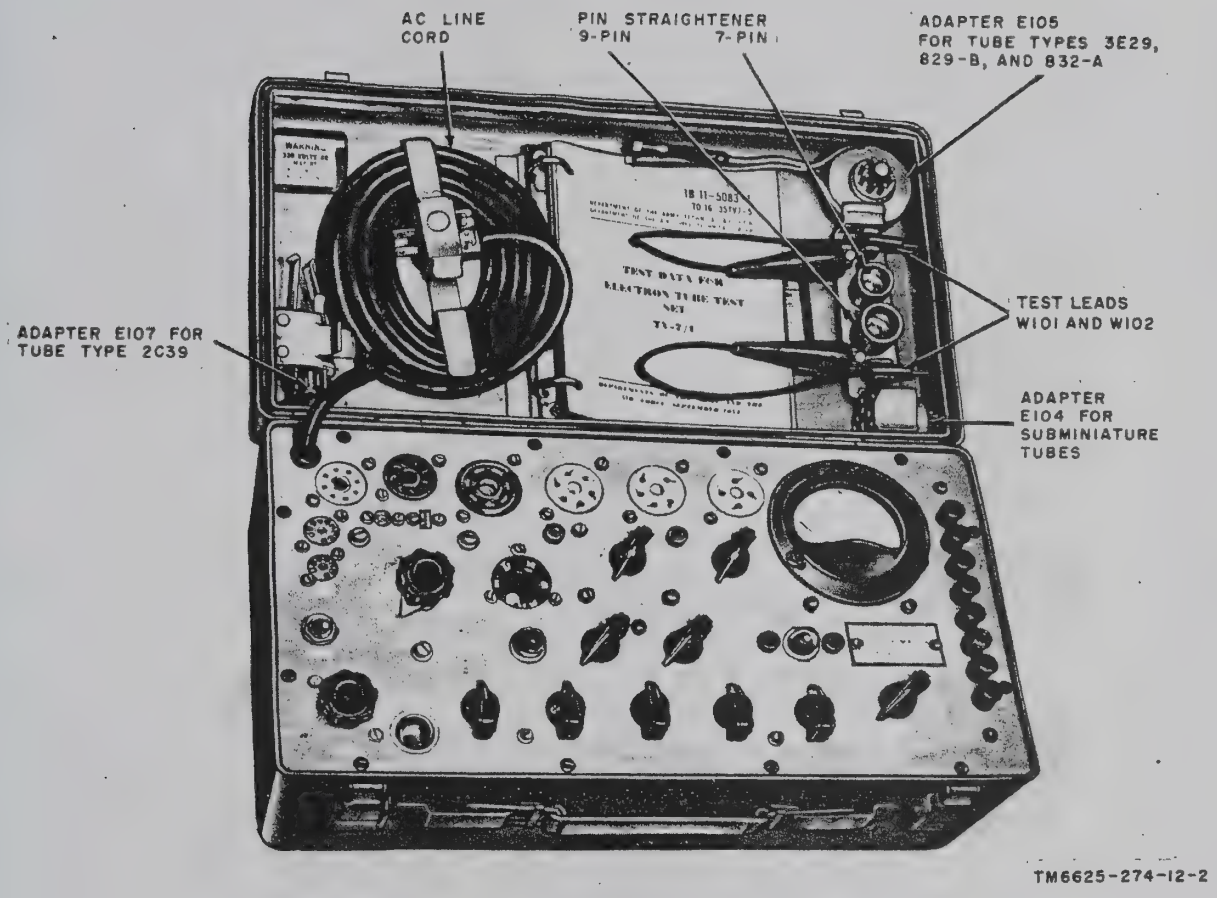
AC LINE CORD
PIN STRAIGHTENER 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER E104 FOR SUBMINIATURE TUBES
TM6625-274-12-2

Figure 3. Test Set, Electron Tube TV–7B/U, less running spares.

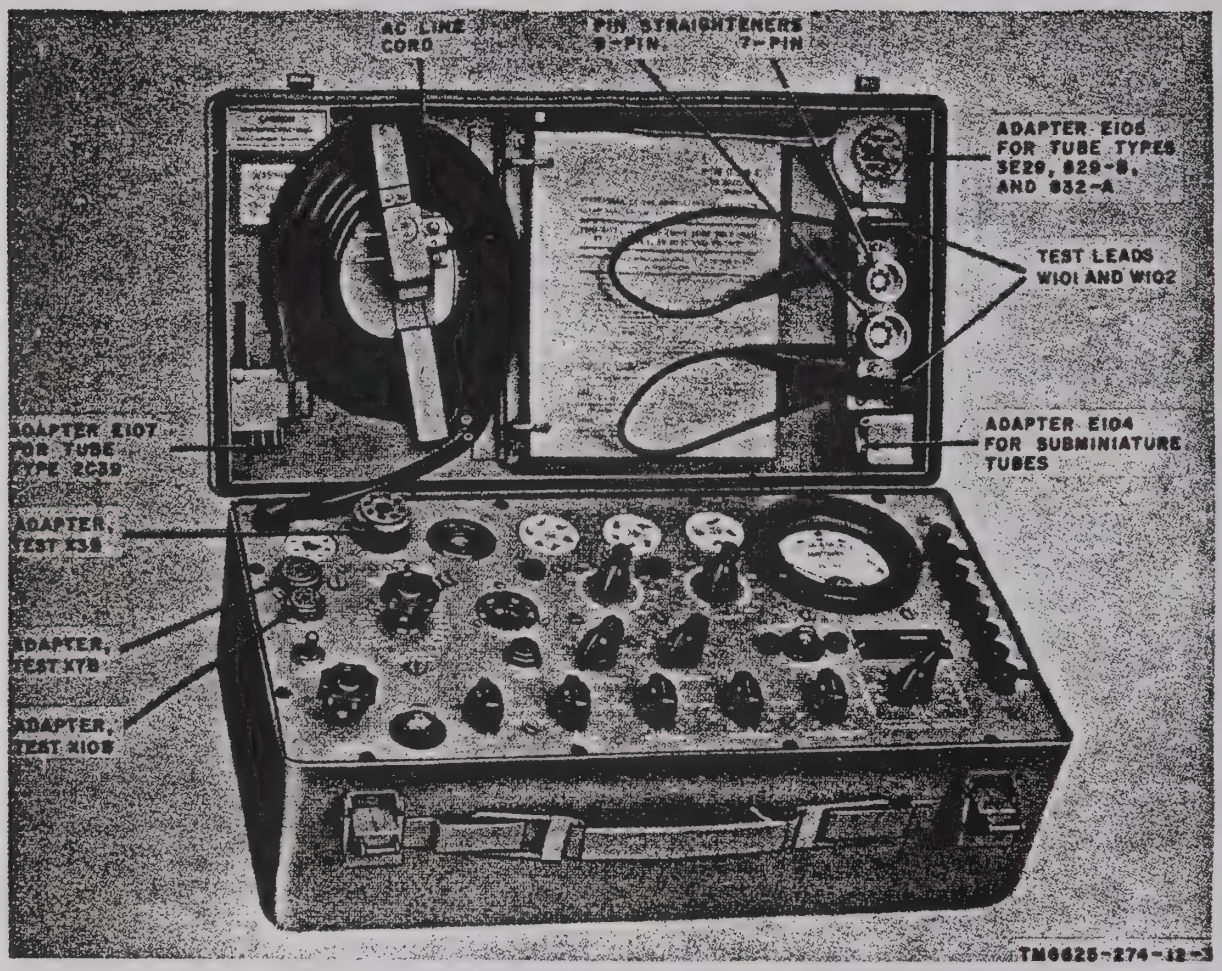
AC LINE CORD
PIN STRAIGHTENERS 9-PIN 7-PIN
ADAPTER E105 FOR TUBE TYPES 3E29, 829-B, AND 832-A
TEST LEADS W101 AND W102
ADAPTER E104 FOR SUBMINIATURE TUBES
ADAPTER E107 FOR TUBE TYPE 2C39
ADAPTER, TEST X3B
ADAPTER, TEST X7B
ADAPTER, TEST X10B
TM6625-274-12-3

Figure 4. Test Set, Electron Tube TV–7D/U, less running spares.

b. Official nomenclature followed by (*) is used to indicate all models of the equipment item covered in this manual. Thus, Test Set, Electron Tube TV-7(*)/U represents Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

2. Forms and Records

a. Electronic Failure Report. Fill out and forward DD Form 787-1, Electronic Failure Report-Signal Equipment, to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700-39.

b. Unsatisfactory Equipment Report. Fill out and forward AF TO Form 29, Unsatisfactory Report, to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00-35D-54.

c. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6, Report of Damaged or Improper Shipment, as prescribed in AR 700-58 (Army), Navy Shipping Guide, Article 1850-4 (Navy), and AFR 71-4 (Air Force).

d. Preventive Maintenance Form. Prepare DA Form 11-266 (fig. 11 and 12), Maintenance Check List for Signal Equipment (Test Equipment), in accordance with instructions on the form.

e. Parts List Form. Any comments concerning omissions and discrepancies in appendix II or III in this manual will be prepared on DA Form 2028 and forwarded directly to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J. ATTN: SIGFM/ES-ML.

f. Comments on Manual. Forward all other comments on this manual direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

Test Set, Electron Tube TV-7(*)/U is a portable tube tester of the dynamic mutual conductance type. It is used to test and to measure performance capabilities and to determine rejection limits for electron tubes used in receivers, low-powered transmitters, and many other electronic equipments. The following tests can be made with Test Set Electron Tube TV-7(*)/U:

a. Continuity test (ballast tubes).

b. Dynamic mutual conductance test (amplifier tubes).

c. Emission test (rectifier tubes).

d. Gas test (amplifier tubes).

e. Noise test.

f. Panel lamp test.

g. Shorts test.

4. Technical Characteristics

Power Supply:	
Input voltage	103.5 to 126.5 volts ac, single phase.
Frequency	50 to 1,000 cps.
Power consumption ..	45 watts at 115 volts, 50 cps.
Meter	0 to 120 arbitrary units.
Operating temperature limits	—40° to +125° Fahrenheit.
Number of tubes	2.
Indicator lights:	
PILOT	One type 47.
SHORTS	One type NE-45.
FUSE	One type 81.

5. Table of Components

The components of Test Set, Electron Tube TV-7(*)/U are listed in *a* below and the spare parts in *b* below.

a. Components.

Quantity	Item	Dimensions (in.)			Unit weight (lb)
		Height	Depth	Length	
1	Test set including tubes and lamps	6 1/16	8¾	15¾	18
1	Adapter E105: 8E29, 829-B or 832-A tubes				
1	Adapter E107: 2C39 tube				
1	Adapter E104: Subminiature tubes				
1	Adapter X10B: socket saver, 7-pin miniature (TV-7D/U)				
1	Adapter X7B: socket saver, 9-pin miniature (TV-7D/U)				
1	Adapter X8B: socket saver, octal (TV-7D/U)				
2	Test leads				
1 set	Running spares (*b* below)			15	

b. Spare Parts.

Quantity	Item
1	Electron tube, type 5Y3WGTA
1	Electron tube, type 83
1	Lamp, neon NE-45
1	Lamp, incandescent No. 47
1	Lamp, incandescent No. 81

6. Description of Test Set

(fig. 1-4)

a. Test Set, Electron Tube TV-7(*)/U (test set) is self-contained in a carrying case equipped with a carrying handle. The cover is secured to the case by luggage-type fasteners. Retainer brackets on the inside of the cover are used to secure and store the power cable, pin straighteners for 7- and 9-pin miniature tubes, and adapters (par. 16). A ring binder inside the cover holds TB 11-5083-1 (tube test data book (par. 15)). The cover is hinged by slip hinges and can be removed from the case.

b. An indicating meter and all controls, knobs, pushbuttons, sockets, and indicating lamps are on the front panel. The necessary data for setting and operating the controls to test the various tube types are contained in the tube test data book (*a* above). One end of the alternating current (ac) line cord is permanently attached to the panel; the other end terminates in a male plug.

7. Differences in Models

Test Sets, Electron Tube TV-7(*)/U are similar in purpose, operation, and appearance. Some models have been modified to improve operational features. External differences are as follows:

Item	TV-7/U	TV-7A/U	TV-7B/7	TV-7B/U
F RANGE on FUNCTION SWITCH.	Not used.	Not used.	Not used.	Used.
BIAS and SHUNT controls	Markings engraved on a dial.	Markings etched into test set panel.	Markings etched into test set panel.	Markings etched into test set panel.
SHORTS lamp	No panel marking.	Panel marking.	Panel marking.	Panel marking.
Subminiature tube test socket X109.	Rectangular.	Round on some equipments.	Rectangular.	Rectangular.
Storage clip for ac line cord plug.	Not used.	Used.	Used.	Used.
Storage clips for test leads	Not used.	Not used.	Used.	Used.
Tip of test lead plug (2 each)	3/32-inch diameter.	5/64-inch diameter.	3/32-inch diameter.	3/32-inch diameter.

Item	TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
Grid (G), plate (P), and NOISE jacks.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 5/64-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.	Accommodates 3/32-inch diameter tip plugs.
Gasket around edge of cover	Not used.	Used.	Used.	Used.
Socket saver adapters X10B, X7B, and X3B, 7-pin and 9-pin miniature and octal base.	Not provided.	Not provided.	Not provided.	Provided.

CHAPTER 2
INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. Unpacking

a. Packaging Data. When packed for shipment, the test set is packaged in an inner fiberboard carton. Spare parts are in a small, corrugated carton, protected by a sleeve on top of the test set. The inner fiberboard carton is sealed with gummed tape, and is then placed within an outer fiberboard carton, with all seams and joints sealed with water-resistant, pressure-sensitive tape. A wooden packing case may also be used when a multiple of four test sets is shipped. The wooden packing case will be strapped only for intertheater shipment. A typical packing case and its contents are shown in figure 5.

(1) The inside dimensions of a packing case that contains four packaged test sets is approximately 18¾ by 20½ by 15¾ inches; the volume is 4.8 cubic feet, and the weight is 106 pounds.

(2) The outside dimensions of a test set packed in fiberboard cartons is 21½ by 10⅞ by 8½ inches; the volume is

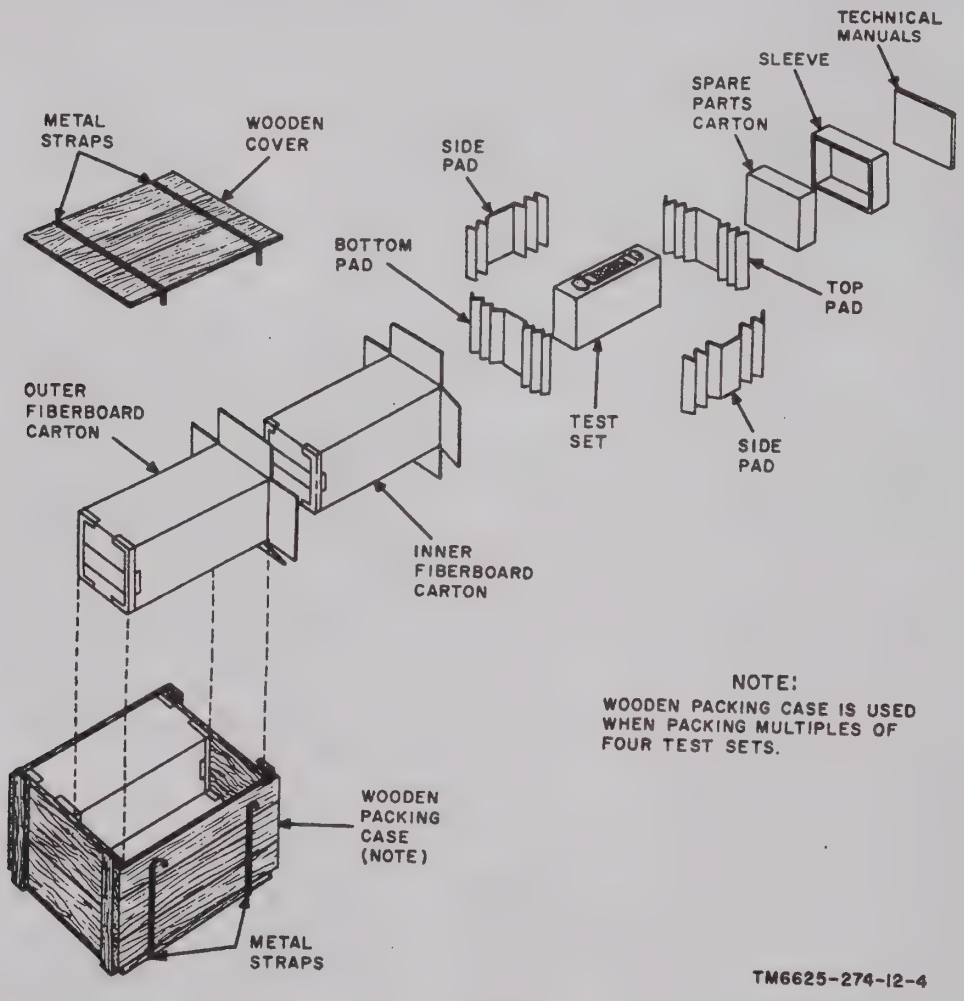

Figure 5. Typical packaging.

1,2 cubic feet, and the weight is 21½ pounds.

b. Removing Contents.

(1) Cut and fold back the metal straps (when used).

(2) Remove the nails from the wooden cover and one side of the wooden packing case with a nailpuller. Remove the cover and the side. Do not attempt to pry off the cover or the side; prying may damage the equipment.

(3) Remove the envelope that contains the technical manuals.

(4) Remove the outer fiberboard carton from the wooden packing case.

(5) Open the outer fiberboard carton and remove the inner fiberboard carton.

(6) Open the inner fiberboard carton and remove the contents.

9. Checking Unpacked Equipment

Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (par. 5) as a general check. If the equipment is damaged, refer to paragraph 2. After a test set is removed from its fiberboard container, release the fasteners, open the cover, and proceed as follows:

a. Check to see that the adapters (fig. 8) are held firmly to the cover.

b. Check all controls for ease of rotation. Tighten loose knobs.

c. Check for a broken meter glass and broken lamps.

d. Check the ac line cord, test leads, and rubber gasket around the edge of the cover (except on TV-7/U) for signs of deterioration.

Section II. CONTROLS AND INDICATORS

10. General

Improper setting of the FILAMENT VOLTAGE switch (fig. 6) or incorrect operation of the pushbutton switches may damage the tube under test. Be sure that all the controls and switches are set properly before testing tubes.

11. Controls, Indicators, and Jacks

a. Switches and Controls.

Switch or control	Function
POWER switch	ON: Connects ac power to test set. OFF: Removes ac power from test set.
FILAMENT VOLTAGE (20-position rotary switch)	Provides an 18-step selection of filament voltages from 0.6-volt to 117 volts ac. BLST.: Enables ballast tubes to be tested for continuity and supplies voltage to certain rectifier tubes for emission tests. OFF: Removes voltage from FILAMENT VOLTAGE switch.
FILAMENT selectors, left and right (10-position, 5-section rotary switches)	Connects filament of tube under test to filament voltage supply.
GRID selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects control grid of tube under test to bias and signal voltages.
PLATE selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects plate of tube under test to plate voltage supply.
SCREEN selector (10-position, 5-section rotary switch)	When set in one of positions 1-9, connects screen grid of tube under test to screen voltage supply.
CATHODE selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects cathode of tube under test to desired test circuit.
SUPPRESSOR selector (10-position rotary switch, 0-position open)	When set in one of positions 1-9, connects suppressor grid of tube under test to desired test circuit.

Switch or control	Function
FUNCTION SWITCH (11-position, 8-section rotary switch (TV-7D/U), 10-position, 6-section rotary switch on all other models)	SHORTS: Positions 1-5 connect various elements of tube under test to shorts test circuit. RANGES: Positions A-E (A-F, TV-7D/U) control sensitivity of meter circuit and magnitude of signal voltage.
LINE ADJUST control	Adjusts amount of input voltage to power transformer.
BIAS control	Adjusts amount of bias voltage applied to tube under test.
SHUNT control	Adjusts sensitivity of meter circuit.

b. Pushbutton Switches.

Pushbutton switch	Function	
	Switch position	*Action*
1—LINE ADJ.	Depressed	Connects meter into line test circuit.
	Normal	Disconnects meter from line test circuit.
2—DIODE	Depressed	Connects diode tube under test to an ac test voltage, and connects low screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed. [a]
	Normal	Removes ac test voltage from diode under test and connects normal screen grid voltage (if required) to tube under test when pushbutton 3—MUT. COND. is depressed.
3—MUT. COND.	Depressed	Connects tube under test to plate and screen grid (when required) voltages.
	Normal	Removes plate and screen grid (when used) voltages from tube under test.
4—GAS 1	Depressed	Connects ac test voltage to certain diode tubes and connects plate voltage and bias voltage to tube under test when checking amplifier tubes for gas.
	Normal	Removes diode test voltage or plate voltage and bias voltage from amplifier tube under test.
5—GAS 2 (used with 4—GAS 1 when amplifier tubes are tested for gas)	Depressed	Connects a resistor into control grid circuit of tube under test.
	Normal	Short-circuits resistor in control grid circuit of tube under test.
6—OZ4	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
7—RECT.	Depressed	Connects tube under test to an ac test voltage. [a]
	Normal	Removes ac voltage from tube under test.
8—METER REV.	Depressed	Reverses polarity of voltage applied to meter.
	Normal	Permits normal polarity of voltage to be applied to meter.

[a] Voltage will vary slightly, depending on LINE ADJUST setting.

c. Meter, Indicator Lamps, and Jacks.

Note. The jacks on the TV-7A/U accommodate 5/64-inch diameter tip plugs; the jacks on all other models of the test set accommodate 3/32-inch diameter tip plugs.

Meter, indicator lamp, or jack	Function
Meter	Indicates condition of tube under test. A LINE TEST mark at midscale is used to establish correct input voltage to power transformer.
SHORTS lamp (not a panel marking on TV–7/U)	Indicates and locates shorted tube elements.
PILOT lamp	Indicates when power is delivered to test set.
FUSE lamp	A fuse and an overload indicator.
Grid (G) and plate (P) jacks	Provide a means of connecting grid and plate test leads to bias and plate voltage circuits, respectively.
NOISE test jacks (2)	Enables test set operator to check level of noise generated by tube under test.

Section III. OPERATION UNDER USUAL CONDITIONS

12. General Instructions

Do not operate the test set until the functions of the controls and the indicators (par. 11), the operating procedure (par. 18), and the use of the test data book (par. 15) are understood. Refer to paragraph 24 whenever a special testing procedure is indicated in the test data book.

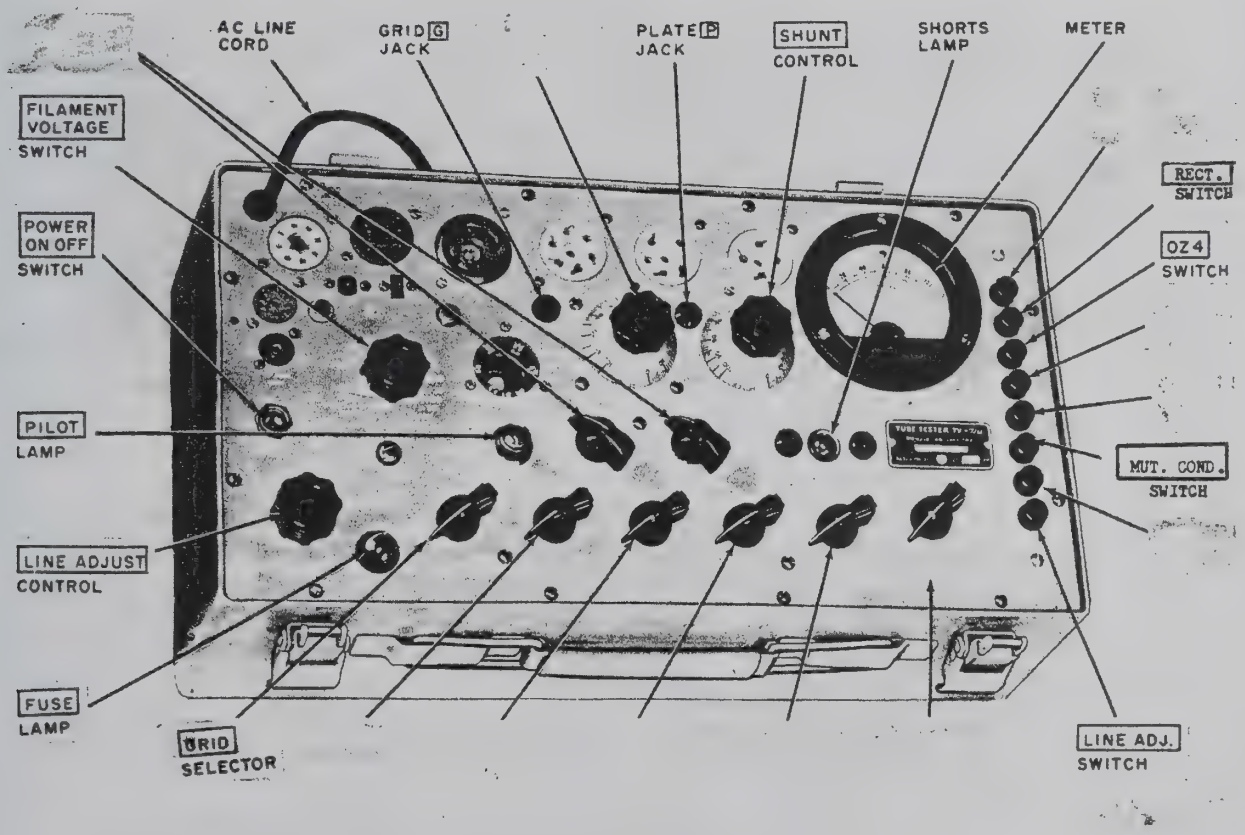

Figure 6. Test Set, Electron Tube TV–7/U, front panel.

13. Test Leads

Two test leads are provided to make connections from the grid (G) and the plate (P) panel jacks to the top caps of tubes under test. Each test lead is terminated on one end in a 3/32-inch diameter tip plug (5/64-inch on TV-7A/U) and on the other end in a battery-type clip with an insulating cover. The test leads are stored inside the cover of the test set case.

14. Tube Test Sockets

(fig. 7)

After the controls on the test set have been set as directed in the tube test data book (par. 15), place the tube to be tested in the proper tube test socket listed below. Socket-saver adapters (par. 16*d*) are mounted in the 7- and 9-pin miniature sockets and in the octal socket on the TV-7D/U (fig. 4).

Tube test socket	Tube type tested
4 pin	Four-pin standard tubes.
5 pin	Five-pin standard tubes.
6 pin	Six-pin standard tubes.
7 pin	Seven-pin standard tubes and panel lamps.
OCTAL	Octal (8-pin) tubes.
LOKTAL	Loktal base (8-pin) tubes.
SUB MIN. (2)	Round (8-pin) or flat-type (7-pin) subminiature tubes.
NOVAL	Nine-pin miniature tubes.
7 PIN MIN	Seven-pin miniature tubes.
ACORN	Acorn type tubes.

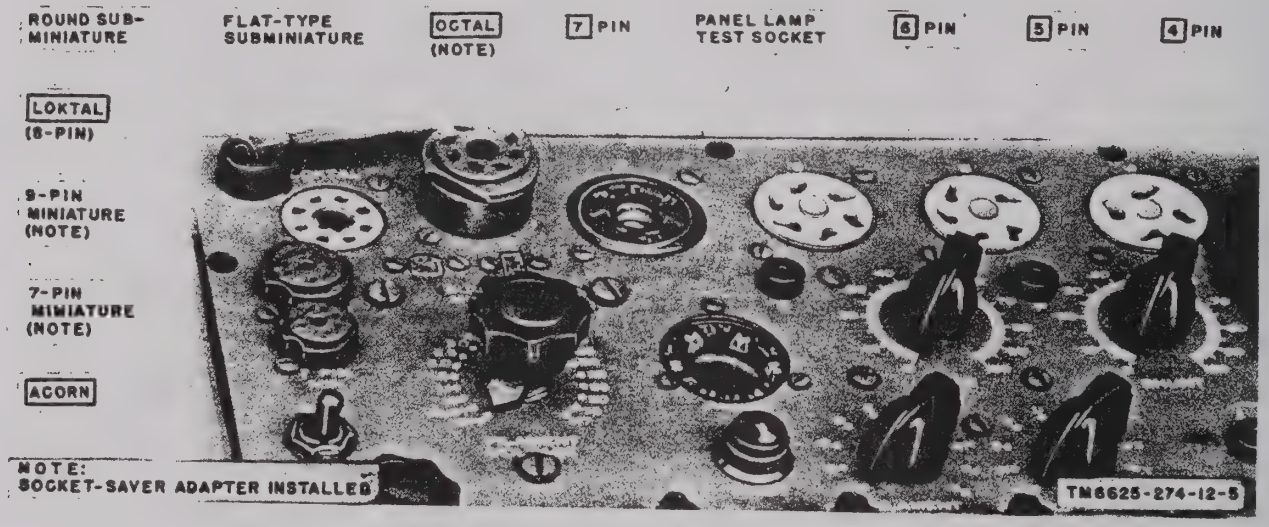

Figure 7. Test sockets, socket-saver adapters installed.

15. Tube Test Data

TB 11-5083-1 (test data book) is mounted on the inside of the cover of the test set. The test data book contains operating instructions for the test set, information necessary to set the controls when testing various tube types, a conversion table for VT tube designations, and a data table for CV type tubes. The control settings for the various tube types are tabulated in nine columns. Read the headings from left to right as follows:

a. Tube Type. Type numbers of electron tubes which the test set is designed to test are listed numerically and alphabetically in this column. Tubes that have type letters instead of numbers, such as XXB, are listed at the end of the table.

b. Fil. Correct filament or heater voltages for the listed tube types are shown in this column.

c. Selectors. The correct setting for the two FILAMENT selectors and the GRID, PLATE,

SCREEN, CATHODE, and SUPPRESSOR selectors are listed in this column. The settings are shown in the same order in which the switches appear on the panel, listing first the two FILAMENT selectors and then continuing, from left to right, with the remaining selectors.

d. Bias. This column lists the setting for the BIAS control.

e. Shunt. This column lists the setting for the SHUNT control. Setting of this control is required only when the FUNCTION SWITCH is in the RANGES A SHUNT position.

f. Range. The settings for the FUNCTION SWITCH are listed in this column. The letters A through E (A through F, TV-7D/U) correspond to the RANGES markings for the FUNCTION SWITCH.

g. Press. Under this heading are listed the test pushbuttons that are used for the various tube types and their individual sections in the case of multipurpose tubes.

h. Min Value. The minimum, numerical values of meter indication for the various tubes and individual sections of multipurpose tubes are shown in this column. Any tube showing a meter reading less than the value indicated in this column should be replaced.

i. Notations. Special information pertaining to particular tube types is listed under this heading.

16. Adapters

a. Adapter E104. Adapter E104 (fig. 8) enables subminiature tubes with long leads to be tested in the OCTAL socket of the test set. A spring locking action grips the leads of the tube after they are inserted in the adapter. Pull the two tabs upward to open the lock before inserting the leads. The lock is secured by pressing down on the two tabs until a click is heard.

b. Adapter E105. Adapter E105 (fig. 8) enables tube type 3E29, 829-B, or 832-A to be tested in the OCTAL socket of the test set. The adapter consists of a special socket for these tubes mounted on an octal base. The two leads on the adapter connect to the two plate caps of the tube under test.

c. Adapter E107. Adapter E107 (fig. 8) enables tube type 2C39 (a lighthouse tube) to be tested in the OCTAL socket of the test set. The three pairs of spring contacts, from the center outward, connect to the cathode and one side of the filament, to the grid, and to the plate, respectively, of the tube under test. The center contact connects to the other side of the filament of the tube under test.

d. *Socket-Saver Adapters (TV-7D/U).* Three socket-saver adapters (fig. 7) are included with each TV-7D/U: one 7-pin miniature, one 9-pin miniature, and one octal. The adapters are installed in their corresponding sockets and receive the wear rather than the permanent socket. When worn so that satisfactory contact can no longer be made, the socket-saver adapters can be replaced without disconnecting the leads from their respective test socket.

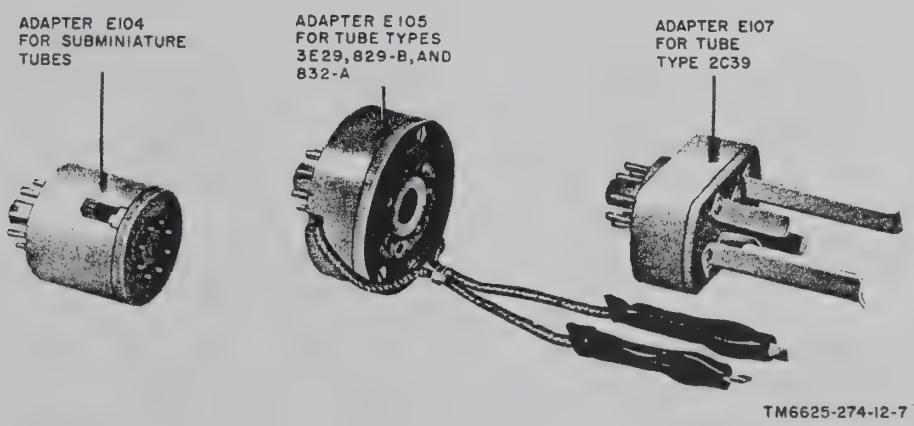

Figure 8. Adapters E104, E105, and E107.

Section IV. OPERATING TEST SET

17. Starting Procedure

Before operating the test set, perform the starting procedure below to check the general operation of the equipment. If the results obtained from the procedures in *b* through *e* below are satisfactory, the test set is ready for operation.

Note. If an abnormal indication is obtained during the starting procedure, refer to the equipment performance checklist (par. 35) for corrective measures.

a. Connect the test set to a 115-volt ac, 50- to 1,000-cycle per second (cps), power source.

b. Set the POWER switch to the ON position; the PILOT lamp should light.

c. Press pushbutton 1 — LINE ADJ. Rotate the LINE ADJUST control knob until the meter pointer rests over the LINE TEST mark on the meter face.

d. Release pushbutton 1 — LINE ADJ.

e. Check the short test circuit.

(1) Set the left FILAMENT selector at A, the right FILAMENT selector at P, and the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selectors at 0, 0, 0, 2, and 2, respectively.

(2) Rotate the FUNCTION SWITCH through the five SHORTS positions. The neon SHORTS lamp (fig. 6) should glow in positions 2 and 3 of the FUNCTION SWITCH to indicate that the short test circuit is functioning properly.

f. Set the POWER switch to the OFF position.

18. Operating Procedure

The procedures below apply to single-section and multipurpose tubes (tubes that have more than one set of elements in the same envelope). Test each section or group of elements of a multipurpose tube separately. Test data for the multipurpose tube types are listed by sections (pentode sect., triode sect., diode sect., etc) in the test data book.

Caution: **Do not insert a tube into a test socket until all the controls have been set in accordance with the instructions below.**

a. Selectors. The FILAMENT (left and right), GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches select the test socket connections so that correct test voltages are applied to the elements of the tube under test. For clarity, these selector switches will, in some instances, be referred to collectively as "the selectors". When referred to collectively, they are considered in the same order as above.

b. Setting Controls.

(1) Locate the type number of the tube to be tested in the test data book (fig. 1-4).

(2) Turn the FILAMENT VOLTAGE knob to the position shown in the *Fil* column of the test data book.

(3) Set the selectors to the letters and the numbers indicated in the *Selectors* column in the test data book. Be sure the numbers indicated by the selector knobs are the same, if read from left to right, as the numbers in the test data book.

Example: **To test a tube type 6SN7, the *Selectors* column in the test data book indicates that the selectors are to be set at HY4-5062. Start at the left and turn the FILAMENT (left) selector knob to H, and the FILAMENT (right) selector knob to Y. Turn the GRID selector knob to number 4; the PLATE selector knob to number 5; the SCREEN selector knob to number 0; the CATHODE selector knob to number 6; and the SUPPRESSOR selector knob to 2. The sequence of letters and numbers thus selected (HY4-5062) is identical with that listed in the test data book. The selectors are interconnected electrically so that two different voltages cannot be applied to the same tube pin at the same time. Therefore, accidental shorts are avoided.**

(4) Set the BIAS control to the number indicated in the *Bias* column of the test data book.

(5) Set the SHUNT control to the number indicated in the *Shunt* column of the test data book. If no setting is indicated, disregard this step and proceed with the steps below.

(6) Set the FUNCTION SWITCH knob to 1.

(7) Insert the tube to be tested in the

proper test socket (fig. 7) and, if the instructions in the *Notations* column require it, connect panel jacks G or P to the tube caps with the test leads.

(8) Set the POWER switch to the ON position. The PILOT lamp should light.

Note. For tubes of the heater cathode type, allow approximately 5 to 10 seconds for the cathode to reach operating temperature before testing the tube.

(9) Adjust the meter pointer (par. 17*c* and *d*) to the LINE TEST mark on the meter scale.

Note. Some tubes, such as the 17DE4 and the 32ET5, require the meter pointer to be set at a position other than the LINE TEST mark. Refer to the *Notations* column of the test data book before testing the tube.

c. Shorts Test.

(1) Turn the FUNCTION SWITCH knob from position 1 to position 5; meanwhile tap the tube lightly and watch the neon SHORTS lamp on each switch position. Tubes with shorted elements will cause the lamp to glow.

Note. A list of tubes that are not to be tapped during the shorts test is contained in the test data book.

(2) A short is indicated by a steady glow on *both* halves of the SHORTS lamp. A flash when the switch is turned from one position to another does not indicate a defective tube. Intermittent flashing when the tube is tapped indicates the existence of loose elements which can cause noisy or erratic operation.

(3) Tubes that have more than one section, such as the 25D8, must be tested for shorts on each section.

(4) Discard a shorted tube without further tests.

Note. Some tubes will show a shorted condition on certain positions of the FUNCTION SWITCH even though they are good tubes. Check the *Notations* column in the test data book for remarks. "Short on 1 and 2" would mean that a short indication in positions 1 and 2 is normal.

(5) If the tube is not shorted, other tests may be performed as required.

d. Selection of Range. Turn the FUNCTION SWITCH knob from the SHORTS side of the switch to the RANGES position indicated in the test data book under the column headed *Range*. This automatically sets the sensitivity of the meter circuit to the proper level for the tube under test.

e. Operating Pushbuttons.

***Caution:* Do not press pushbutton 3 — MUT. COND. when testing rectifier tubes.**

(1) Press the pushbutton (par. 11*b*) that is indicated in the *Press* column of the test data book.

***Caution:* Release the pushbutton as soon as the meter pointer comes to rest and the meter indication is read. If the pushbutton is depressed too long, the tube under test may be damaged.**

(2) Refer to the *Notations* column for special information pertaining to specific tube types.

(3) When the correct pushbutton is depressed, the meter will indicate the condition of the tube. Compare the meter reading to the value indicated in the *Min value* column of the test data book.

19. Checking Filament Continuity (12-Volt Filament Tubes)

Certain electron tubes in the 12-series may have open filament center taps that may not affect the testing or the operation of these tubes, if the tube is used in a 12-volt filament circuit. The test set does not have a specific filament continuity test circuit. A visual check for filament continuity of tube types 12AT7, 12AU7, 12AV7, 12AX7, and 12AZ7 can be made as follows:

a. Perform the starting procedures (par. 17).

b. Set the FILAMENT VOLTAGE switch to 12.6.

c. Set the left and right FILAMENT selector switches to E and to V, respectively.

d. Set the GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selector switches each at zero.

e. Insert the tube in its proper test socket and perform the procedures in paragraph 17*b* through *d*.

f. Observe the filament of the tube; both sides should be lighted.

Note. Do not prolong the continuity test; keep the filament lighted just long enough to make a thorough observation.

g. Set the POWER switch to the OFF position, and set the FILAMENT VOLTAGE switch to 6.3.

h. Set the left and right FILAMENT selector switches to K and V, respectively.

i. Perform the procedures in paragraph 17*b* through *d*.

j. Observe the filament of the tube; only one-half the filament should be lighted.

k. Set the POWER switch to the OFF position, and set the left and right FILAMENT selector switches to E and Z, respectively.

l. Perform the procedures in paragraph 17*b* through *d*.

m. Observe the filament of the tube; the other half of the filament should be lighted.

n. If the tube shows filament continuity, proceed to test the tube in accordance with the instructions in paragraphs 20 through 22.

20. Reading Meter

The meter scale is calibrated in divisions from 0 to 120. When the proper pushbutton is depressed, the meter pointer will indicate the condition of the tube under test as a numerical value. The numerical value of the meter reading is then compared to the minimum acceptable value in the *Min value* column in the test data book. If the number indicated on the meter is less than the listed minimum value, the tube should be replaced. The following chart may be used to convert the numerical value of the meter reading to mutual conductance in micromhos.

Meter reading	Corresponding value in micromhos			
	Range B	Range C	Range D	Range E (Note)
0	0	0	0	0
10	250	500	1,250	2,500
20	500	1,000	2,500	5,000
30	750	1,500	3,750	7,500
40	1,000	2,000	5,000	10,000
50	1,250	2,500	6,250	12,500
60	1,500	3,000	7,500	15,000
70	1,750	3,500	8,750	17,500
80	2,000	4,000	10,000	20,000
90	2,250	4,500	11,250	22,500
100	2,500	5,000	12,500	25,000
110	2,750	5,500	13,750	27,500
120	3,000	6,000	15,000	30,000

Note. Ranges E and F, TV–7D/U.

21. Gas Test

Pushbuttons 4 — GAS 1 and 5 — GAS 2 are used when testing amplifier tubes for gas content. Multipurpose tubes are tested for gas only on the amplifier sections; the gas test does *not* apply to diode sections or to rectifier tubes. Allow tubes of the filament type to warm up before testing the tube for gas content.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the controls as indicated in the test data book.

c. Insert the tube in the proper test socket and set the POWER switch to ON.

d. Hold down pushbutton 4 — GAS 1 and adjust the BIAS control (fig. 6) until the meter pointer indicates 10 on the scale.

Note. If the meter pointer cannot be adjusted down to 10, turn the BIAS control knob until the meter reading is 100.

e. Hold down pushbutton 4 — GAS 1 and press pushbutton 5 — GAS 2.

f. If the tube contains gas, the meter pointer will move up the scale. A movement of more than 1 division on the scale indicates a gassy tube.

g. Turn off the test set (par. 26).

22. Noise Test

The NOISE test jacks on either side of the SHORTS lamp (fig. 6) are used when testing electron tubes for noise. A radio receiver or an audio amplifier with a loudspeaker, and a set of test leads, are required to perform the test.

a. Perform the starting procedures (par. 17).

b. Set the controls for the tube under test as indicated in the test data book, and set the POWER switch to ON.

c. Set the FUNCTION SWITCH to SHORTS 1.

d. Connect a test lead to each of the NOISE jacks.

e. Connect the test lead from the left-hand NOISE jack to the chassis of the radio receiver or the audio amplifier.

f. Connect the test lead from the right-hand NOISE jack to either the antenna of a radio receiver or to the input of an audio amplifier. Turn the radio receiver or the audio amplifier power switch to the on position.

g. Tap the tube under test while the FUNCTION SWITCH is turned from position 1 through position 5.

h. Intermittent disturbances within the tube which are too brief to register on the SHORTS lamp will be reproduced as static by the loudspeaker.

i. Turn off the test set (par. 26).

23. Panel Lamp Test

The receptacle in the center of the large, 7-pin socket (fig. 7) is used to check panel lamps.

a. Perform the procedures in paragraph 17*a* through *d* and *f*.

b. Set the FILAMENT selector switches to HR.

c. Set the FILAMENT VOLTAGE switch to the proper voltage for the lamp to be tested. If the exact voltage is not known, set the FILAMENT VOLTAGE switch to 0.6 volt and increase the voltage as required.

d. Insert the lamp in the receptacle and press the center contact of the lamp firmly against the bottom of the receptacle; then tilt the lamp until the metal shell makes contact with the rim of the receptacle. A defective lamp will not light.

e. Turn off the test set (par. 26).

24. Testing Special Tube Types

a. Special Testing Procedures. Certain electron tubes, such as the 6CD7, 6DA5, 6360, and 6524, require a special testing procedure. The 1-megohm resistors required to test the 6CD7 and the 6DA5, and the 30-volt battery required to test the 6360 and the 6524, are not supplied with the test set. The selectors are set for the tube under test in the normal manner. However, *before* the POWER switch is set to the ON position, the resistors or the battery is connected to the test socket pins as directed in the test data book.

Caution: **Disconnect the 30-volt battery *before* resetting any of the selector switches.**

b. Voltage Regulators. When voltage regulator tubes are tested, sufficient voltage must be applied to ionize the gas and to cause the voltage regulator tube to conduct. Refer to the test data book for the proper use of the pushbuttons and for control settings.

c. Thyratrons. To test thyratrons, set the controls as indicated in the test data book. Press the proper pushbutton and adjust the BIAS control until the tube strikes; this is indicated by a glow between the tube elements and a sharp rise of the meter pointer. The limits of the bias voltage between which the tubes should strike are shown in the test data book. After the tube strikes, the condition of the tube is read on the meter.

d. Tuning Eye Tubes. Set the controls as indicated in the test data book. When the proper pushbutton is depressed, note the effect on the tuning eye and compare it to the data in the *Notations* column. When the eye is closed, a thin, bright line is observed; when the eye is open, a wide, dark area is observed.

25. Testing Subminiature Tubes

Subminiature tubes are tested in SUB. MIN. sockets X109 and X110 (fig. 9).

a. Subminiature tubes of the round type with short wire leads or pins are tested in special socket X110. This circular socket has eight contacts.

(1) Several basing arrangements (fig. 10) are used for these tubes. The arrows near several of the tube bases in figure 10 indicate the location of the dot on the base of the tube. Check the *Notations* column in the test data book; examine the tube and identify the basing. Use adapter E104 (par. 16*a*) when the subminiature tube has long leads.

(2) Insert the leads or pins in the corresponding contacts of socket X110. If the leads are long enough, set the POWER switch to the OFF position, grasp each lead about one-eighth inch from its end with the tips of a pair of long-nosed pliers, and insert the leads into the proper socket contacts. Set the POWER switch to the ON position and test the tube.

b. Subminiature tubes of the flat or in-line-contact type with pins or leads are tested in flat socket X109 (fig. 9). The tube pins or leads must be inserted so that the dot on the base of the tube is directly in line with the small, molded dot on the socket.

c. Subminiature tube types are identified in the test data book by a star beside the type number. The applicable basing for the various round types is indicated in the *Notations* column. The basing designation letter refers to the diagrams shown in figure 10.

Figure 9. Top view of sockets X109 (flat) and X110 (circular).

26. Stopping Procedure

a. Set the POWER switch to the OFF position.

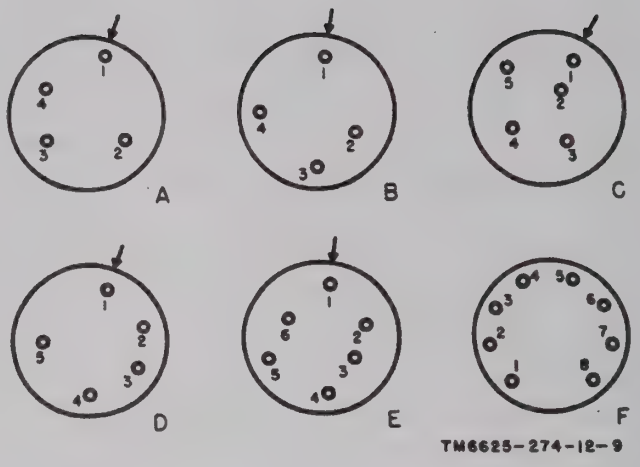

Figure 10. Basing diagrams for subminiature tubes (letters, A, B, C, D, E, and F identify basing for use with test data book).

b. Remove the tube under test from the test socket.

c. Place the adapters, if used, under the clamps on the inside of the cover.

d. Disconnect the ac line cord from the power source and wind it counterclockwise around the retainer bracket on the inside of the cover. Secure the plug under the storage clip (TV-7B/U and TV-7D/U, fig. 3 and 4), or under the coiled ac line cord (TV-7/U and TV-7A/U).

e. Place the test leads, if used, in the storage clips (not on TV-7/U). On the TV-7/U, store the test leads under the coiled ac line cord or as shown in figure 1.

f. Close the cover and secure the fasteners.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

27. General

The test set is designed for normal operation through a temperature range from —40° F to +125°F. The operation of the equipment may be more difficult in regions where extreme cold, heat, humidity, or moisture conditions prevail. Paragraphs 28 through 30 provide operational information that may be used to minimize the effects of regional extremes.

28. Operation at Low Temperatures

Subzero temperatures and climatic conditions associated with cold weather may effect the efficient operation of the test set.

a. Extreme cold makes the ac line cord and other rubber parts stiff and brittle. Handle the equipment carefully to avoid cracking the insulation on the ac line cord and on the test leads.

b. Keep the equipment in a warm, dry location. If possible, keep the test set in a heated enclosure. A standby heater is not provided; therefore, leave the test set turned on if possible.

c. Allow the test set to warm up for 10 to 15 minutes before testing tubes. The length of warmup time depends upon the temperature of the surrounding air.

d. If equipment that has been exposed to the cold is brought into a warm room, moisture will form on it and may cause fogging of the meter glass. Dry the equipment thoroughly.

e. Keep the cover of the test set closed at all times when the equipment is not in operation. This will prevent an accumulation of moisture within the equipment due to sweating.

29. Operation Under Tropical Conditions

Warm, damp climates expose the equipment to damage from moisture and fungus. The high relative humidity causes condensation when the temperature of the equipment drops below that of the surrounding air. Adequate ventilation will minimize this condition. Keep the cover of the test set closed as much as possible. Wipe all moisture and fungus from the exterior of the test set with a clean, lint-free cloth.

30. Operation in Desert Climates

Desert climates expose the test set to damage from dirt, dust, sand, and the effects of strong sunlight. Provide means for keeping dust and sand from entering the holes in the test sockets, adapters, and jacks, and from accumulating around the pushbuttons and other moving parts of the test set. Clean and dust the equipment frequently. When not in use, keep the cover closed to keep dust and dirt out of the exposed parts.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

31. General

The procedures in paragraphs 33 through 39 are to be performed by the operator or organizational maintenance personnel. Operator's maintenance consists of preventive maintenance (par. 33), visual inspection (par. 34), and replacement of electron tubes (par. 37) and lamps (par. 39). Organizational maintenance of the test set is limited to preventive maintenance (par. 33) and to the replacement of the adapters (fig. 8), knobs and pushbuttons, indicator light lens, cable clamps, and clip insulators. The only tools required are those tools normally available to the repairman-user because of his assigned mission.

32. Materials Required

The materials required for operator's and organizational maintenance are as follows:

a. Cleaning compound (Federal stock No. 7930-395-9542).

b. Cleaning cloth.

c. Sandpaper, #0000.

33. Preventive Maintenance

a. DA Form 11-266. DA Form 11-266 (fig. 11 and 12) is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items not applicable to the test set are lined out in figure 12. References in the ITEM block in figure 12 are to paragraphs that contain additional maintenance information pertinent to the particular item. Instructions for the use of the form appear on the form.

b. Items. The information shown below supplements DA Form 11-266. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the case, the front panel, and the adapters. If necessary, wet a cloth with cleaning compound and then wipe the parts with a dry, clean cloth.
2	Inspect the clips that hold the adapters and the clips that hold the test leads (TV-7B/U and TV-7D/U) for tight spring action. Check the ring binder for proper operation. Check the PILOT, FUSE, and SHORTS lamps for broken glass. Check to see that the socket-saver adapters (fig. 7) are tightly secured in their respective test sockets.

***Warning*: Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.**

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE: TEST SET, ELECTRON TUBE TV-7D/U

EQUIPMENT SERIAL NUMBER: 2404

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		8 FEB '60	Harold Andrews
	✓	22 FEB '60	James Drake

4

DA FORM 1 MAY 57 11-266

TM6625-274-12-10

Figure 11. DA Form 11-266, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF FEBRUARY 1960

NO.	DAILY ITEM	1 17	2 HA 16	3 HA 15	4 HA 20	5 HA 21	6 HA 22	7 HA 23	8 HA 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1.	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, ~~CASES, CABINETS, CONTROL PANELS, INTER-CONNECTING PLUGS~~, CABLES, ~~HEADSETS~~, METER WINDOWS, ETC. PAR. 31b	✓	✓	✓	✓	✓	✓	✓	✓									✓
2.	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, JACKS, ~~CONNECTORS~~ AND PILOT LIGHTS. PAR. 31b	✓	✓	✓	✓	✓	(X)	✓	✓									✓
3.	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS.	✓	✓	✓	✓	✓	-	✓	✓									✓
4.	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓									✓

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, WIRE ~~AND SHOCK-MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PAR. 9d	✓					✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, LATCHES, HINGES.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION.	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					X

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: ~~CRYSTALS~~, FUSES, ~~CONNECTORS, PLUG-IN COILS~~, LAMPS, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNAS, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, BUSHINGS, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. ~~INSPECT JACKS AND CONNECTORS FOR OPEN CUT AND BENT CONTACTS.~~	
17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.~~	
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREW TYPE TERMINALS OF TRANSFORMERS~~, FIXED CAPACITORS, RESISTORS, ~~CHOKES~~, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES~~; CLEAN INTERIOR OF CHASSIS ~~AND CABINETS~~.	✓
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.	✓
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 11. METER GLASS BROKEN.
REPORTED TO HIGHER ECHELON
MAINTENANCE FOR REPLACEMENT.

2 3

Figure 12. DA Form 11-266, pages 2 and 3.

TM6625-274-12-11

34. Visual Inspection

a. When the equipment fails to perform properly, check the items listed below.

(1) Test leads, if used, poorly connected or improperly connected.
(2) Incorrect pushbutton depressed.
(3) Improper setting of selector switches or controls (par. 18*b*(3)).
(4) Battery or resistors improperly connected (par. 24*a*).
(5) FUSE lamp defective.
(6) LINE ADJUST control improperly adjusted (par. 17*c*).

b. If the above checks do not locate the trouble, proceed to the equipment performance checklist (par. 35).

35. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. All corrective measures that the operator or the organizational maintenance man can perform are given in the *Corrective measures* column. When using the checklist, start at step 1 and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed and the corrective measures that were taken. Perform the steps in *b* below.

b. Checklist.

	Step	Item	Action or condition	Normal indication	Corrective measures
PREPARATORY	1	Ac line cord.	Connect ac line cord to power source.		
	2	POWER switch.	Set switch to ON position.	PILOT lamp lights.	Check ac line cord connection. Remove (par. 39*a*) and check (par. 23) PILOT lamp; replace if defective. Remove (par. 39*a*) and check (par. 23) FUSE lamp; replace if defective. Higher echelon repair required.
	3	Meter.		Pointer stays at zero.	Defective type 86 tube; replace tube (par. 37) .
	4	Pushbutton 1—LINE ADJ.	Depress pushbutton.	Meter pointer moves up-scale.	Higher echelon repair required.
	5	LINE ADJUST control knob.	Rotate control knob, while holding pushbutton 1—LINE ADJ. down, until meter pointer is directly over LINE TEST mark.	Meter pointer moves when control knob is turned.	Check for low-line voltage if pointer will not adjust properly. Higher echelon repair required.
	6	Selectors.	Set selectors as directed in paragraph 17*e*(1).	Selector knobs should be tight and point directly at a number or letter. The switch detents should be positive.	When a selector pointer is between two numbers or two letters, rotate switch fully counterclockwise. Loosen knob setscrew, turn knob until it points directly at the first number or letter, and tighten setscrew. Tighten loose knobs. If switch detents are not positive, higher echelon repair is required.
	7	FUNCTION SWITCH.	Rotate switch through the five SHORTS positions.	SHORTS lamp glows at positions 2 and 3 of switch.	Check switch settings. Replace SHORTS lamp (par. 39*b*). Higher echelon repair required.
	8	POWER switch.	Set switch to OFF position.	PILOT lamp goes out.	

	Step	Item	Action or condition	Normal indication	Corrective measures
START	9	Selectors and controls.	Set according to test being performed.		
	10	Tube under test.	Insert in proper test socket. Make connections as required.	Tube pins enter test socket without forcing.	Check for bent pins. Straighten pins of miniature tubes in one of the pin straighteners.
	11	POWER switch.	Set switch to ON position.	PILOT lamp lights.	
EQUIPMENT PERFORMANCE	12	Meter.	Checking tube for dynamic mutual conductance, emission, or gas.	Meter pointer indicates condition of tube under test when proper pushbutton is depressed.	If meter pointer stays at zero, tube under test may be defective. Check setting of selectors and controls. Test another tube. Higher echelon repair required.
	13	BIAS control.	Gas test.	Meter pointer can be adjusted to 10 by turning control knob.	Adjust BIAS control knob until pointer indicates 100, then proceed with gas test.
	14	Panel lamp test socket.	Checking a panel (pilot) lamp (par. 23).	A good lamp will light.	Make good contact between lamp and test socket. Check control settings. Lamp may be defective; check other lamps if available. Higher echelon repair required.
	15	Adapter E104 (fig. 8).	Testing long lead subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Unsnap locking device on adapter, move tube up and down to check seating of leads, and secure locking device. Test tube again. Check control settings. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Replace adapter and check tube again. If meter pointer does not move when correct pushbutton is depressed, test another tube. Higher echelon repair required.
	16	Adapter E105 (fig. 8).	Testing tube type 3E29, 829-B, or 832-A.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of adapter and tube. Check plate lead for a good connection. Check setting of controls. Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	17	Adapter E107 (fig. 8).	Testing tube type 2C39.	Meter indicates condition of tube when pushbutton 3 — MUT. COND. is depressed.	Check seating of tube and adapter. Remove adapter and tube and squeeze spring contacts closer together if necessary. Check setting of controls. Replace adapter and tube in test socket and test tube again.

	Step	Item	Action or condition	Normal indication	Corrective measures
EQUIPMENT PERFORMANCE					Test another tube. If meter pointer does not move, replace adapter. Higher echelon repair required.
	18	Socket X109 (fig. 9).	Testing flat subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Check to see that dot on base of tube is aligned with dot on test socket. Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Test another tube. Higher echelon repair required.
	19	Socket X110 (fig. 9).	Testing round subminiature tube.	Meter indicates condition of tube when proper pushbutton is depressed.	Slide tube leads up and down in test socket to insure good contact. Check setting of controls. Check *Notations* column in test data book for type basing used. Compare placement of tube leads to basing diagram (fig. 10). Test another tube. Higher echelon repair required.
STOP	20	Tube under test.	Remove from test socket.		
	21	POWER switch.	Set to OFF position.	PILOT lamp goes out.	
	22	Ac line cord.	Remove ac line cord plug from power source.		

36. Removal of Chassis

a. Removal.

(1) Unsnap the latches and open the cover of the test set.

(2) Unwind the ac line cord from the retainer bracket and remove the cover from the test set. Remove the cover by sliding it to one side until the hinge pins are disengaged.

(3) Remove the screws that secure the front panel to the case.

(4) Hold the front panel to the case, turn the test set over, and gently place it on a clean, flat surface.

(5) Slowly lift the test set case upward until it is clear of the chassis.

b. Replacement.

(1) Position the test set case so that the handle is forward.

(2) Carefully lower the test set into the case. Be sure that no wires are caught between the front panel and the edge of the case.

(3) Replace the screws that secure the front panel to the case. Tighten the screws in rotation a little at a time to prevent binding.

(4) Replace the cover on the case, wind the ac line cord counterclockwise on the retainer bracket, secure the plug under the clip (not on TV-7/U), close the cover, and secure the latches.

37. Tube Replacement

When trouble occurs, check the ac line cord connection and the control settings before removing any tubes. If tube failure is suspected, use the tube substitution method (*a* below) to check the tubes.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller.**

a. Tube Substitution Method. Replace a suspected tube (*b* below) with a new tube. If the equipment still does not work, remove the new tube and put back the original tube. Repeat this procedure with the other tube. If the test set is still inoperative, other checks are required (par. 35*b*).

b. Replacing Tubes in Test Set, Electron Tube TV-7(*)/U. Check the tubes in the test set as follows:

(1) Remove the chassis from the case (par. 36*a*).

(2) Remove the tube clamp (fig. 13) from the threaded stud and remove the tube.

Caution: **Be careful not to hit the meter case with tube type 83 when removing the tube.**

(3) Replace the tube (*a* above) with one of the running spares.

(4) Set the tube (or a replacement) in the socket and secure it with the tube clamp.

(5) Replace the chassis in the case (par. 36*b*).

38. Preferred-Type Tubes

A preferred-type electron tube, type 5Y3WGTA, has been developed as a direct replacement for nonpreferred types 5Y3GT and 5Y3WGT (par. 7). The 5Y3WGTA is used in the power supply. When replacement of a 5Y3GT or a 5Y3WGT is necessary, replace it with a 5Y3WGTA. Do not substitute a 5Y3GT or a 5Y3WGT for a 5Y3WGTA.

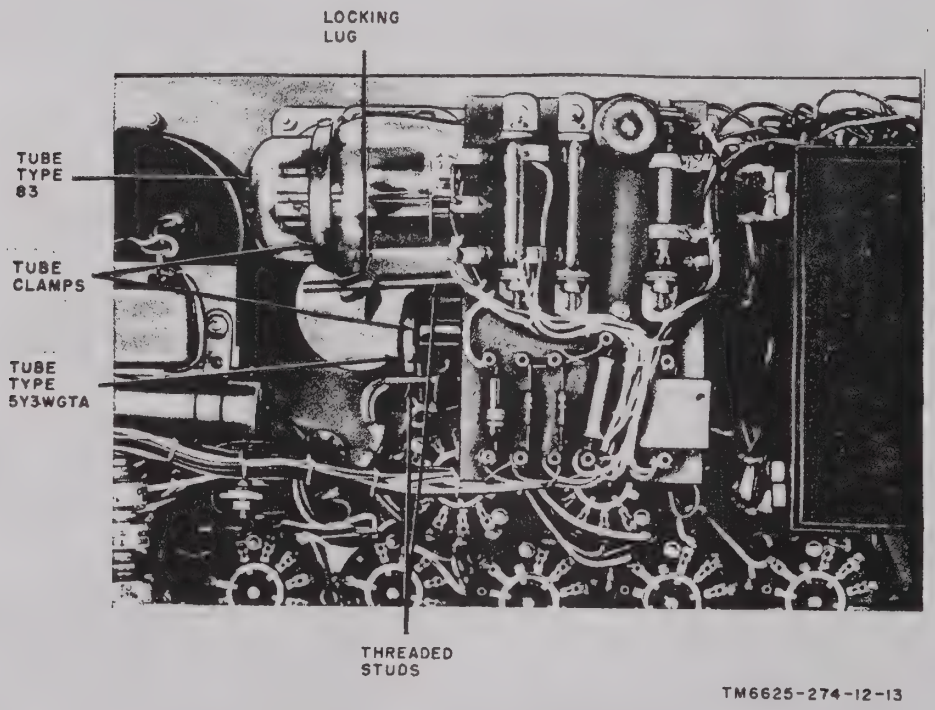

Figure 13. Tube location.

39. Replacement of Lamps

The FUSE, PILOT, and SHORTS lamps are removable from the front panel of the test set.

a. The FUSE lamp and PILOT lamp have bayonet-type bases. Unscrew and remove the PILOT lamp indicator jewel to gain access to the PILOT lamp. To remove either lamp, press downward, turn the lamp to the left, and lift straight up. To replace the FUSE or PILOT

lamp, insert the lamp in the appropriate socket, press downward, turn the lamp to the right, and release it. Replace the PILOT lamp indicator jewel.

b. The SHORTS lamp has a screw-type base. Remove the lamp by turning it to the left; replace the lamp by turning it to the right.

CHAPTER 4
SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

40. Removal From Service

a. Set the POWER switch to the OFF position and disconnect the test set from the power source.

b. Place the adapters under the clamps on the cover.

c. Wind the ac line cord counterclockwise around the retainer bracket and place the plug under the clip (not on TV-7/U). Place the test leads under the coiled ac line cord (TV-7/U and TV-7A/U) or as shown in figures 1 and 2. On the TV-7B/U and the TV-7D/U, insert one end of the test leads into the storage clips and connect the alligator clips to the studs (fig. 3 and 4).

d. Close the cover and secure it with the latches.

41. Repackaging for Shipment or Limited Storage

(fig. 14)

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 8) will also be helpful.

a. Material Requirements. The following materials are required for repackaging Test Set, Electron Tube TV-7(*)/U. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Flexible corrugated fiberboard	10 sq ft
Waterproof wrapping paper	10 sq ft
Gummed paper tape	3 ft
Pressure-sensitive tape	4 ft
Metal strapping (⅝- by 0.020-inch) (*Note.* Strapping seals required)	8 ft
Wooden box (inside dimensions: 18⅜ by 10¼-by 7⅞-inch)	1 ea (9 bd ft)

b. Packaging.

(1) *Technical manual.* Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the seams with pressure-sensitive tape.

(2) *Spare parts.* Wrap each part within a layer of flexible corrugated fiberboard. Seal the seams with gummed paper tape. Overwrap the flexible corrugated fiberboard with waterproof wrapping paper and seal with pressure-sensitive tape.

(3) *Test set.* The procedure used to package the test set is the same as the procedure used to package the spare parts ((2) above).

c. Packing.

(1) Fabricate a wooden box.

(2) Place the packaged test set (*b*(3) above) in the wooden box.

(3) Place the spare parts (*b*(2) above) and the technical manuals on top of the test set.

(4) Nail down the wooden cover.

(5) Strap the wooden box when intertheater shipment is involved.

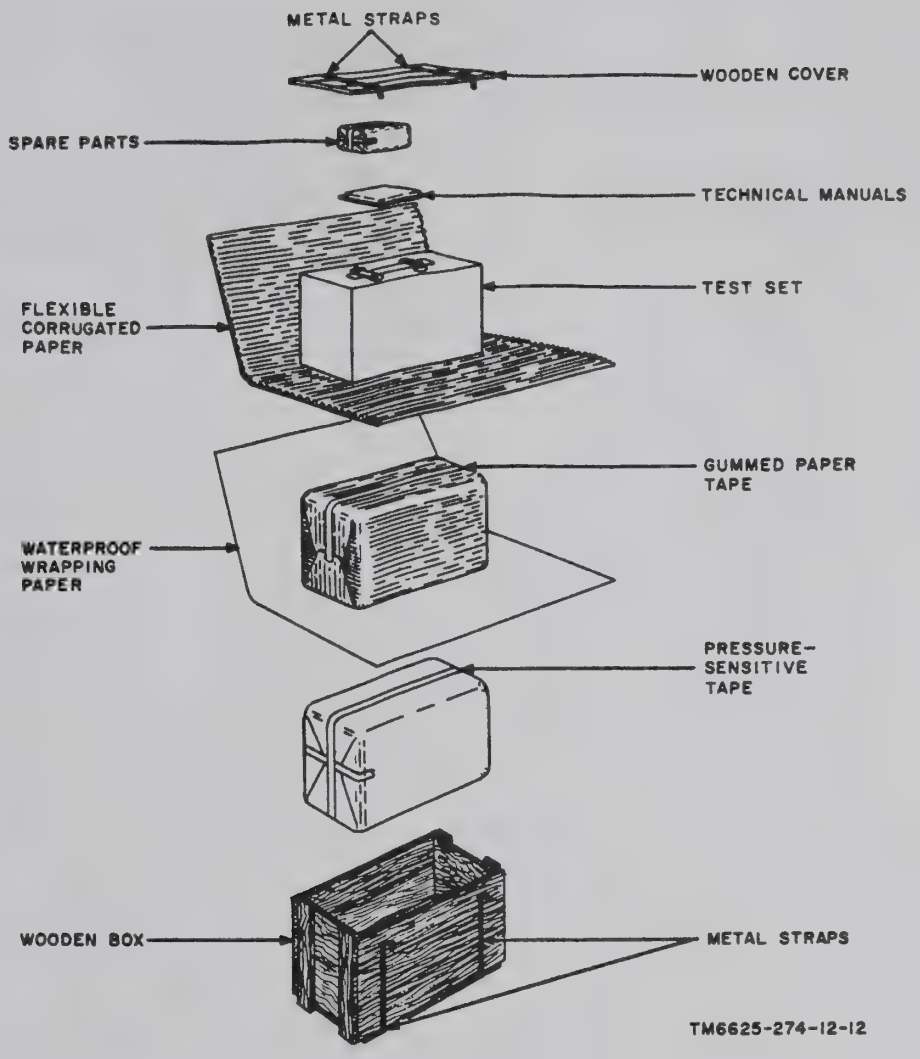

Figure 14. Field repackaging diagram.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

42. Authority for Demolition

The destruction procedures outlined in paragraph 43 will be used to prevent further use of the equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

43. Methods of Destruction

Any or all of the methods of destruction given below may be used.

a. Smash. Use sledges, axes, hammers, crowbars, or any other heavy tools available; smash the case, cover, adapters, front panel, and meter.

b. Cut. Use axes, handaxes, machetes, or knives; cut the ac line cord and test leads.

c. Burn. Use gasoline, kerosene, oil, flamethrowers, or incendiary grenades; burn the technical manuals and test data book.

Warning: **Be extremely careful with explosive and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use grenades, TNT, or firearms, if explosives are necessary.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways.

APPENDIX I
REFERENCES

Following is a list of applicable references available to the operator or organizational maintenance personnel of Test Set, Electron Tube TV-7(*)/U:

SB 38-100	Preservation, Packaging and Packing Materials, Supplies and Equipment Used by the Army
TB 11-5083-1	Tube Test Data for Electron Tube Test Sets TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U

APPENDIX II
OPERATOR'S MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

1. Scope

a. General. This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part* of the major item, and all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns. The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* A dagger (†) indicates the model in which the part is used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustrations (Figure No.).* The numbers in this column refer to the illustration or illustrations where the part is shown.

(9) *Illustrations (Item No.).* This column lists the reference symbols used for identification of items in the illustrations or text of the manual.

2. Critical Items

A zero slash (0) in the "Description" column indicates items that are expected to fail during the first year; also items that will make the equipment inoperative if they fail.

Section II. FIRST ECHELON FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS: FIGURE NO.	(9) ILLUSTRATIONS: ITEM NO.
		1 2 3 4	ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			TEST SET, ELECTRON TUBE TV-7/U; TV-7/A,B,D/U					
			NOTE: Model Column 1 refers to TV-7/U; Column 2 refers to TV-7A/U; Column 3 refers to TV-7B/U; Column 4 refers to TV-7D/U					
	6625-376-4939		TEST SET, ELECTRON TV-7/U; TV-7A,B,D/U:	ea	NX		1,2,3,4	
	Order thru AGC	† † † †	TECHNICAL MANUAL TM 11-6625-274-12P:	ea	X	2		
	Order thru AGC	† † † †	TECHNICAL BULLETIN TB-11-5033-1	ea	X	2		
	Order thru AGC	† † † †	TECHNICAL MANUAL TM11-5083	ea	X	2		
	5935-204-8379	† † † †	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-B-179212	ea	X	1	8	E104
	5935-201-8500	† †	ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-33	ea	X	1	8	E105
	5935-537-4056	† †	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-C-179260	ea	X	1	8	E105
	5935-502-1777	† †	ADAPTER, ELECTRON TUBE SOCKET: Hickok part No. 1050-50	ea	X	1	8	E107
	5935-511-6491	† †	ADAPTER, ELECTRON TUBE SOCKET: Sig dwg No. SW-B-179230	ea	X	1	8	E107
	6625-684-1189	† † † †	ADAPTER, TEST: Victoreen Inst Co part 795-X3B	ea	X	1	4	X3B
	6625-618-9928	† † † †	ADAPTER, TEST: Victoreen Inst Co part 795-X7B	ea	X	1	4	X7B
	6625-618-9929	† † † †	ADAPTER, TEST: Victoreen Inst Co part 795-X10B	ea	X	1	4	X10B
	6625-586-8349	†	COVER, TEST SET: Hickok part No. 3145-333	ea	X	1	3	
	6625-668-4683	† † † †	LEAD, TEST: Hickok part No. 12450-245	ea	X	2	1,2,3,4	W101 W102
			RUNNING SPARES AND ACCESSORY ITEMS					
			TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U					
	5960-262-0218	† † † †	Ⓐ ELECTRON TUBE: MIL type 5Y3WGTA	ea	X	1	15	V102
	5960-100-7323	† † † †	Ⓐ ELECTRON TUBE: MIL type 83	ea	X	1	15	V101
	6240-179-1814	† † † †	Ⓐ LAMP, GLOW: GE part No. NE-45	ea	X	1	15	E101
	6240-014-2306	† † † †	Ⓐ LAMP, INCANDESCENT: GE part No. 81	ea	X	1	15	E103
	6240-155-8706	† † † †	Ⓐ LAMP, INCANDESCENT: GE part No. 47	ea	X	1	15	E102

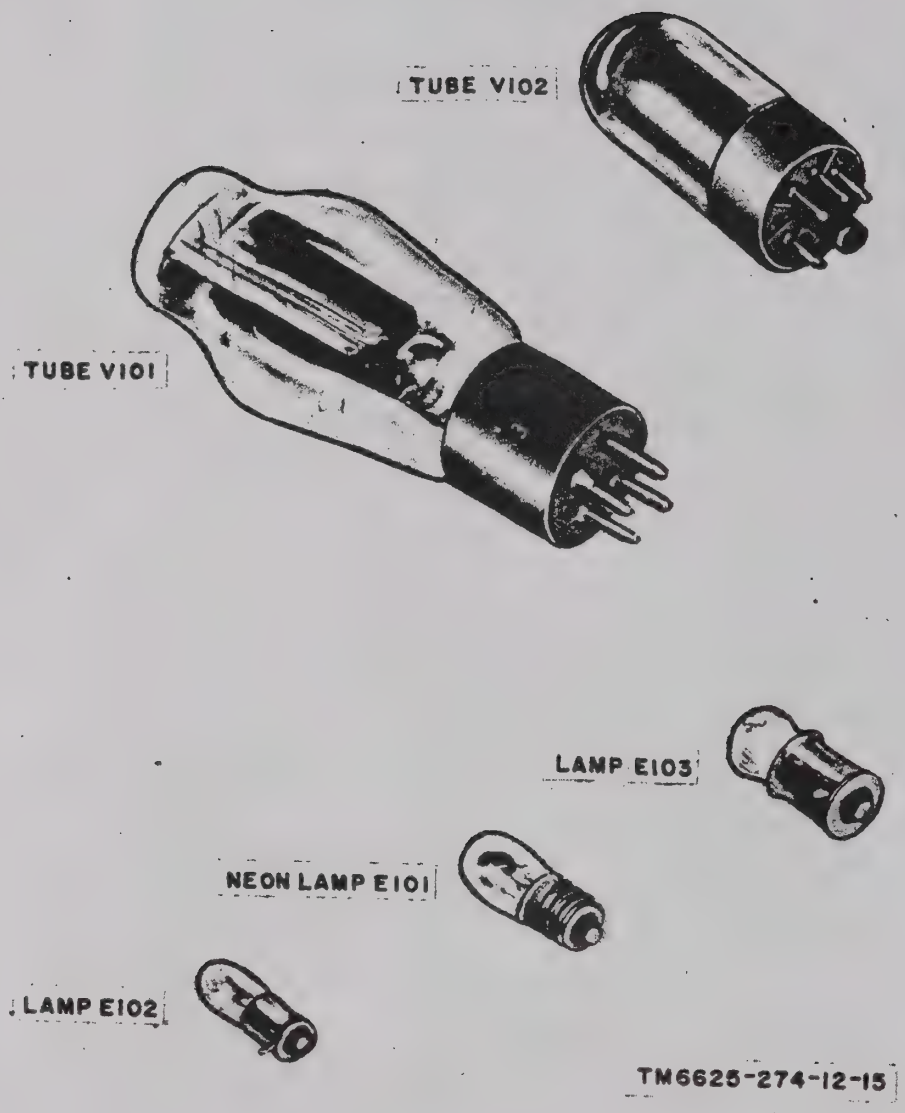

Figure 15. Electron tubes and lamps.

APPENDIX III
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. Scope

a. General. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Allocation of Maintenance Functions. Columns in section II, Allocation of Maintenance Functions, are defined as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(h) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation. Column 5 is not used.

(4) *Tools required.* This column indicates the tool, test, and maintenance equipments required to perform the maintenance functions. These numbers are identified in section III, Allocation of Tools for Maintenance Functions.

(5) *Remarks.* This column contains any notations necessary to clarify the data cited in the preceding columns.

c. Allocation of Tools for Maintenance Functions. Columns in section III, Allocation of Tools for Maintenance Functions, are as follows:

(1) *Tools required for maintenance functions.* This column lists the tools and test equipment required to perform the maintenance functions.

(2) *1st, 2nd, 3rd, 4th, and 5th echelon.* A dagger (†) in columns 3, 5, and 6 indicates that the tool or test equipment is allocated to that echelon. Columns 2 and 4 are not used.

(3) *Tool code.* This column lists the tool code assigned. The numbers are used

in the maintenance allocation chart to refer to the indicated item.

(4) *Remarks.* Not used.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, and clamps.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH.	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ELECTRON TUBE TV-7/U; TV-7A,B,D/U	service	X						
	adjust				X	X	1,2,5	
	inspect	X						Visual only
	test				X	X	1,3,4,6,7	
	replace	X						
	repair				X		5	
	calibrate				X	X	1,2,6,7	
	rebuild					X	5	
ADAPTER, TUBE SOCKET	replace		X					
	repair				X			
BINDER, LOOSE LEAF	replace				X			
BUTTON, PUSH	replace				X		5	
BUMPER, RUBBER	replace				X			
INSULATOR, CLIP	replace		X					
CABLE, POWER, ELECTRICAL	replace				X			
CAPACITOR	replace				X		5	
CASE (2) ELECTRICAL EQUIP CABINET	replace					X	5	
	repair					X	5	
CATCH, LUGGAGE	replace				X		5	
HANDLE, LUGGAGE	replace				X		5	
CLAMP, ELECTRICAL	replace		X					
CONNECTOR	replace				X		5	
DIAL CONTROL	replace				X			
	repair				X			
ELECTRON TUBE	replace	X						

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TV-7/U; TV-7A,B,D/U (continued)								
GASKET, RUBBER	replace				X		5	
	rebuild					X	5	
GROMMET, RUBBER	replace				X		5	
HINGE, BUTT	replace				X		5	
KNOB	replace		X					
LAMP, GLOW	replace	X						
LAMP, INCANDESCENT	replace	X						
LAMPHOLDER	replace				X		5	
LIGHT INDICATOR	replace				X		5	
LENS, INDICATOR LIGHT	replace		X					
LEAD, TEST	replace				X			
	rebuild				X		5	
CLIP, ELECTRICAL	replace				X		5	
JACK, TIP	replace				X		5	
METER, ELECTRON TUBE TESTER	replace				X		5	
	repair					X	5	
RECTIFIER, METALLIC	replace				X		5	
RESISTOR	replace				X		5	
RETAINER, ELECTRON TUBE	replace				X		5	
SOCKET, ELECTRON TUBE	replace				X		5	
STRAIGHTENER, PIN	replace					X		
STUD, THREADED	replace				X			
SWITCH	replace				X		5	
TERMINAL, STUD	replace				X		5	
TRANSFORMER, POWER	replace				X		5	

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH.	(3) 2ND ECH.	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
TV-7/U; TV-7A,B,D/U							
MULTIMETER TS-352/U				†	†	1	
RESISTOR, DECADE ZM-16/U				†	†	2	
TEST SET, ELECTRON TUBE TV-7/U				†		3	
TEST SET, ELECTRON TUBE TV-2/U					†	4	
TOOL EQUIPMENT TE-113				†	†	5	
TRANSFORMER, VARIABLE CN-16/U				†	†	6	
VOLTMETER, METER ME-30/U				†	†	7	
TOOL AND TEST EQUIPMENT NORMALLY AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION		†				8	

By Order of *Wilber M. Brucker*, Secretary of the Army:

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NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.

USAR: None

For explanation of abbreviations used, see AR 320–50.

B. Quality Meter Deflection is smaller than it should be:

The following example is a case I have encountered quite recently.
One person to whom I have sold a TV-2B/U tube tester complained that the deflection of its quality meter is considerably
smaller than it should be. TV-2 tube tester's standard test tube is, as you know very well, 6V6, and the testing of this 6V6 tube
was all right indicating exactly 80/58, and I was not worried about the test value of other kinds of tubes.
The above-mentioned person said that the test result of his 300B power tubes is barely above the value specified as good,
or the borderline. He said that the test result of his tubes by TV-7 tube tester is far better than that tested by TV-2 B/U.
I asked a friend of mine who is familiar with TV-2 tube testers about this problem, and he has agreed that the test value of some triodes by TV-2 tube testers is usually smaller than those by TV-7 tube testers. And that is not any extraordinary or
defective phenomenon.

1) I tried to make every possible check-up of various parts used; quality meter, filament, bias, plate, screen, and signal voltage
meters.
a. the quality meter was okay.
b. the filament voltage meter indication was correct.
b. the bias meter indication was incorrect, approximately 1.4 volts higher than the actual voltage.
c. the plate voltage meter was accurate, and had no problem at all.
d. the screen voltage meter indication was incorrect, on the average 4.8 volts higher than the actual voltage.
e. After zero adjustment by turning the rotary switch to F, and being checked by turning the switch to C position,
the quality meter reading was not large enough.

I studied every circuit that is directly relevant to mutual conductance measurement;

1. Filament and Bias voltages are strongly influential in reading the quality of each tube.
2. Screen voltage in this case was about five volts lower than it should be, so this meter indication must be
made straight so that the appropriate voltage may be applied every time.
3. Signal voltage somehow seems to be lower, because no apparently defective parts were found; (Quality meter, and all the rest of meters had no defects at all.)

Repairs that I have made;
1) Apparent resistor value of the screen voltage meter was obviously lower than the resistor value required,
It was about 249.5 kilohm, but in a case like this, I always evaluate the actual working value more, so by trial and error
bench work, I added 801 ohm to the original resistor in series connection, and then the meter indication and the actual
voltage has become just the same.

2) I deliberately did not modify the bias meter resistor, even though there was about 1 volt difference,because if I modify
this resistor value, the quality meter indication will become lower.

3) I also added 1.8 ohm resistor between R-50 7.14 ohm and the signal voltage meter, which makes about 1 volt
higher than the usual voltage.

After the above modifications, the quality meter has come to indicate about 10 percent higher than before.
Also later I have found the cause of all the low test result was that P4 test switch was faulty, its contact points
had become worse, and as a result the test result value was lower than it should be.

After all I have succeeded in repairing this vintage tube tester, which is still beautiful to look at, and can of course
test most of the vacuum tubes. All the above experiences are not made in vain, but will be useful in repairing other tube testers that have some problems similar to this tube tester.

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Philip Y. Shibuya
Described on August 23rd, 2004.

TM 11-6625-274-35

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

FIELD AND DEPOT MAINTENANCE

MANUAL

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

This Manual includes all Changes in effect at the time of Publication, C4 and C5

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 JUNE 1960

TECHNICAL MANUAL
No. 11-6625-274-35

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *30 June 1960*

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*This manual, together with TM 11-6625-274-12, 14 June 1960, supersedes TM 11-5083, 29 September 1953, including C1, 2 September 1955; C2, 8 February, 1956; C3, 1 April 1959; and C4, 26 August, 1959.

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CHAPTER 1

THEORY

Section I. GENERAL

1. Scope

a. This manual covers field and depot maintenance for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U. It includes instructions appropriate to fourth and fifth echelons for troubleshooting, testing, calibrating, and repairing the equipment; and lists the tools, materials, and test equipment required for fourth and fifth echelon maintenance. Detailed functions of the equipment are covered in paragraphs 3 through 12.

b. The complete technical manual for this equipment includes three other publications: TM 11-6625-274-12, TM 11-6625-274-12P, and TM 11-6625-274-35P.

c. Forward comments concerning this manual to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: Publications Engineering Department, Fort Monmouth, N. J.

Note. For applicable forms and records, see paragraph 2, TM 11-6625-274-12

2. Internal Differences in Models

a. An antiparasitic bead (fig. 1) made of ferrite is placed on the lead soldered to terminal 5 of tube test socket X105 and on the lead soldered to terminal 2 of tube test socket X106 in the TV-7B/U. Antiparasitic beads are also placed on the leads soldered to all tube test sockets of the TV-7D/U, except on the sockets and the terminals listed below.

(1) Tube test sockets X109 and X110.
(2) Pins 1 and 4 of tube test socket X103.
(3) Pins 1 and 4 of tube test socket X105.
(4) Pin 8 of tube test socket X111.

b. Other internal differences are listed in the chart below. For external differences, see TM 11-6625-274-12.

Component	Test set, electron tube				
		TV-7A/U			
	TV-7/U	Serial numbers 1 through 1200	Serial numbers 1201 through 9492	TV-7B/U	TV-7D/U
R113	41 ohms, fixed	41 ohms, variable	1,000 ohms, variable	1,000 ohms, variable	1,000 ohms, variable
R114	280 ohms, fixed	280 ohms, variable	280 ohms, variable	350 ohms, variable	350 ohms, variable
R115	41 ohms, fixed	41 ohms, variable	1,000 ohms, variable	1,000 ohms, variable	1,000 ohms, variable
R117, R123, R124, and R125	Mounted on E106	Mounted on E106	Mounted on E106	Mounted on resistor mounting board	Mounted on resistor mounting board
R124	245K ohms	245K ohms	245K ohms	225K ohms	225K ohms
R130	8,500 ohms, no C tap	8,500 ohms, no C tap	9,500 ohms, C tap used	9,500 ohms, C tap used	9,500 ohms, C tap used
R131 and R132	Not used	10,000 to 20,000 ohms[a]	10,000 to 20,000 ohms[a]	Not used	Not used
R133	Not used	680 ohms	Not used	Not used	Not used
R134 (45 ohms)	Not used	Not used	Used	Designated as R135	Designated as R135

[a]The value of resistors R131 and R132 (if used), which ranges from 10,000 to 20,000 ohms, is determined in production.

Component	Test set, electron tube				
		TV–7A/U			
	TV–7/U	Serial numbers 1 through 1200	Serial numbers 1201 through 9492	TV–7B/U	TV–7D/U
R134 (40,000 ohms)	Not used	Not used	Not used	Used	Used
R135 (45 ohms)	Not used	Not used	Used	Designated as R137	Designated as R137
R137	Not used	Not used	Not used	45 ohms	45 ohms
R139	Not used	Not used	Not used	Not used	350 ohms, variable
R140	Not used	Not used	Not used	Not used	2,700 ohms
R141	Not used	Not used	Not used	Not used	47,000 ohms
CR101	Mounted on E106 or S110	Mounted on S110	Mounted on S110	Mounted on S110	Mounted on S110
S109	6 sections	6 sections	6 sections	6 sections	8 sections
V102	5Y3GT[b]	5Y3WGT[b]	5Y3WGT[b]	5Y3WGTA	5Y3WGTA

bWhen replacing, use a 5Y3WGTA.

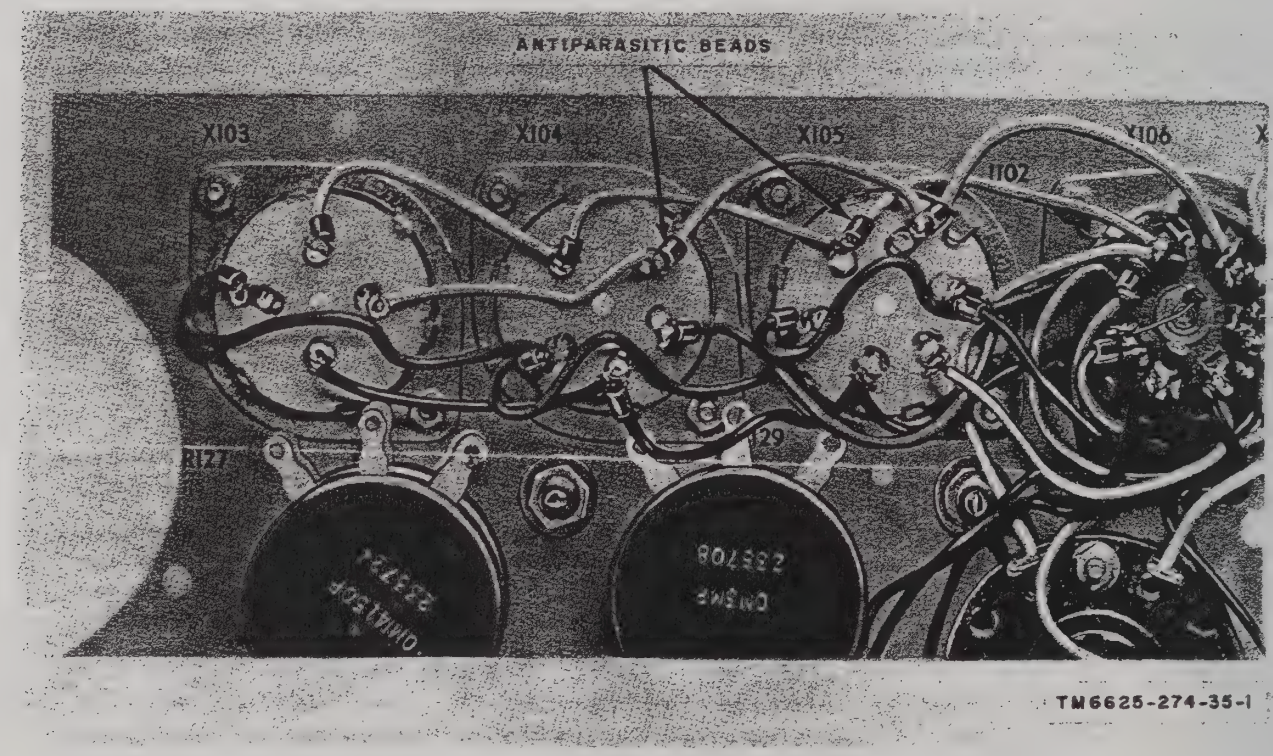


Figure 1. Antiparasitic beads (used on TV–7B/U and TV–7D/U), typical application.

Section II. GENERAL THEORY

3. Block Diagram Analysis
(fig. 2)

The block diagram illustrates the several major circuit sections of the test set and their relation to each other. Voltage from a 115-volt alternating current (ac) power source is reduced and standardized by the operation of the line adjust circuit. For line voltage adjustments, pushbutton 1 — LINE ADJ. is depressed. Voltage is then applied to meter M101 through metallic rectifier CR101. When the meter pointer is directly over the LINE TEST mark, the voltages for the test circuits are standardized.

a. The power supply circuit consists basically of transformer T101 and rectifier tubes V101 and V102. The power supply provides ac voltages for the mutual conductance tests and for the filaments or the heaters of V101, V102, and the tube under test, and provides direct current (dc) voltages for the tube under test. Voltage is applied to the tube under test through FILAMENT VOLTAGE switch S108 and the selector switches.

b. Pushbutton switch assembly S110 provides a selection of various combinations of plate, screen, bias, and signal voltages that are required to test the different types of tubes. Proper selection of these voltages is made through the setting of the selector switches *before* the voltages are applied to the tube under test. The selector switches determine the test socket terminals to which the various test voltages are applied. The FUNCTION SWITCH serves a dual purpose: when shorts tests are made, positions No. 1 through 5 of the SHORTS section of the FUNCTION SWITCH permit the application of an ac voltage to the different elements of the tube under test. When positions A through E (A through F, TV-7D/U) of the RANGES section of the FUNCTION SWITCH are used, the sensitivity of meter M101 and the magnitude of the signal voltage are controlled. Meter M101 indicates the condition of the tube under test.

4. Function of Equipment

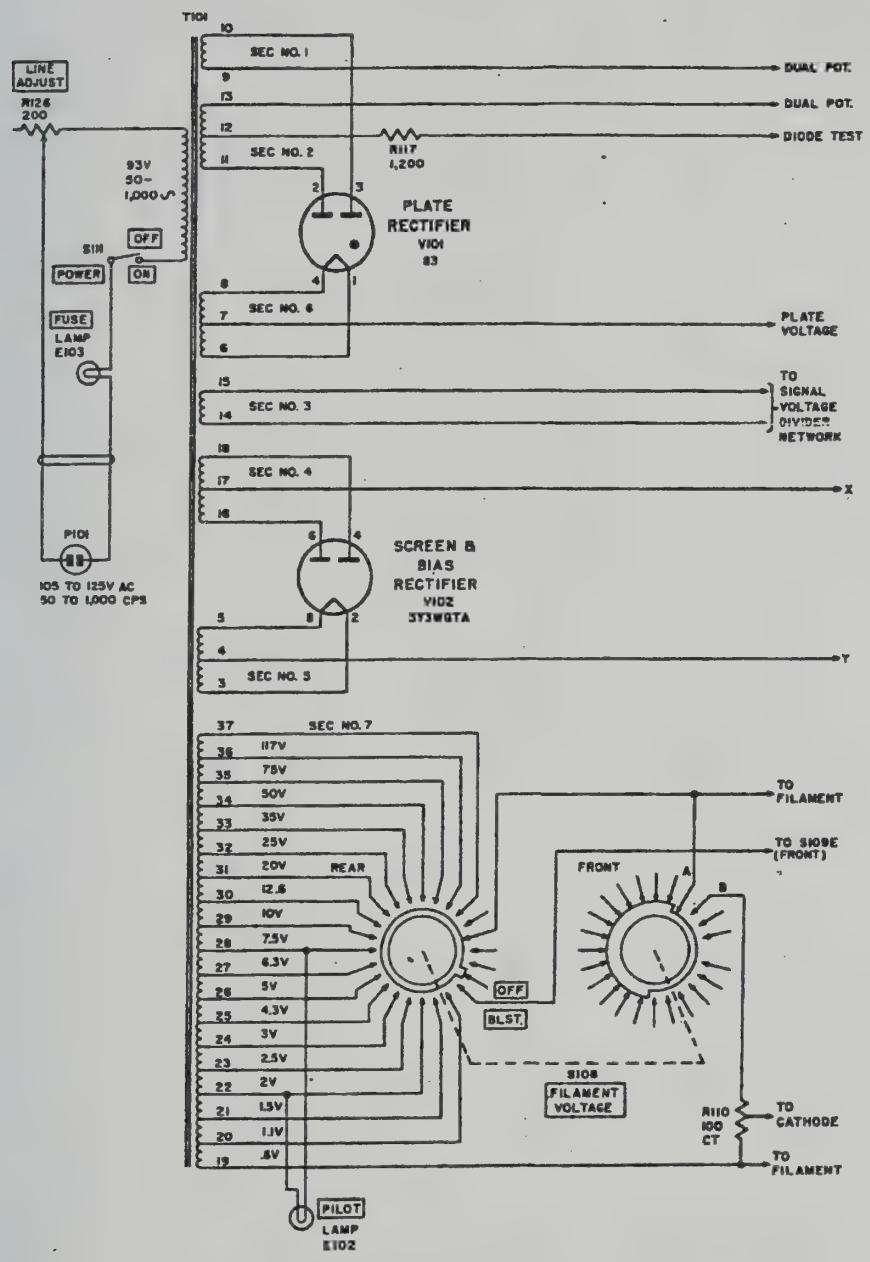
Test Set, Electron Tube TV-7(*)/U employs the dynamic mutual conductance method to test amplifier tubes. The test set consists principally of a power supply to furnish the correct voltages to the tubes under test, a line test circuit, and five tube-testing circuits. These five circuits are shorts, noise test, rectifier test, mutual conductance test, and gas test. Controls and switches permit the application of proper test voltages to the tube under test, and a meter or an indicating lamp displays the test results. The relationship among the principal circuits and parts of the test set are shown in the block diagram (fig. 2).

a. Power Supply (fig. 3). The power supply consists of three supply voltage circuits, each supplied by transformer T101.

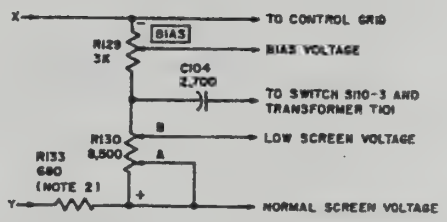
(1) The filament supply consists of secondary windings No. 7 and FILAMENT VOLTAGE switch S108. The FILAMENT VOLTAGE switch is used to select any one of 18 different filament voltages for the tube or panel lamp under test, ranging from 0.6 volt to 117 volts ac. PILOT lamp E102 is connected between terminals 22 and 28 of secondary No. 7, and lights when the POWER switch is set to the ON position.

(2) Full-wave rectifier tube V101 supplies unfiltered, pulsating dc voltage for the plate of the tube under test. Secondaries No. 1 and No. 2 supply the ac voltage for the plates of V101. Filament voltage for V101 is supplied by secondary No. 6.

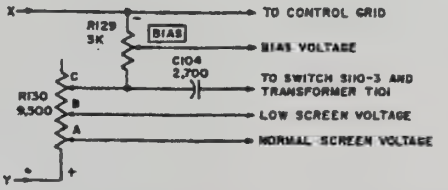
(3) Grid bias voltage and screen grid voltage is supplied to the tube under test by full-wave rectifier tube V102. Secondaries No. 4 and No. 5 supply the operating voltages for V102. Various amounts of bias voltage for the tube under test can be selected by changing the setting of the BIAS control. A separate winding on transformer T101 supplies an ac signal voltage to the grid circuit of the tube under test. Screen grid voltage may be varied by adjusting the taps on resistor R130. Pushbutton 2 — DIODE permits either the normal screen grid voltage or a low screen grid voltage to be applied to the tube under test.



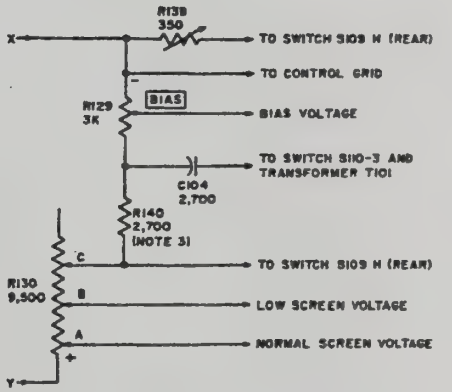
A. POWER SUPPLY



B. VOLTAGE DIVIDER FOR BIAS VOLTAGE AND SCREEN VOLTAGE, TV-7/U AND TV-7A/U, SERIAL NUMBERS 1 THROUGH 1,200.



C. VOLTAGE DIVIDER FOR BIAS VOLTAGE AND SCREEN VOLTAGE, TV-7A/U, SERIAL NUMBERS 1,201 THROUGH 9,492, AND TV-7B/U.



D. VOLTAGE DIVIDER FOR BIAS VOLTAGE AND SCREEN VOLTAGE, TV-7D/U.

NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS AND CAPACITANCES ARE IN UUF.
2. RESISTOR R133, 680 OHMS, IS USED ONLY ON THE TV-7A/U, SERIAL NUMBERS 1 THROUGH 1,200.
3. RESISTOR R140 IS ONLY IN THE CIRCUIT FOR RANGE F OF FUNCTION SWITCH S109.
4. ▭ DENOTES EQUIPMENT MARKINGS.

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Figure 3. Simplified power supply circuit.

b. Line Voltage Test Circuit. The line voltage test circuit primarily consists of meter M101, part of transformer T101, and R126. Line voltage fluctuations across the primary of transformer T101 can be compensated for by adjusting LINE ADJUST control R126, a rheostat, until the meter pointer is directly over the LINE TEST mark. Frequent adjustment of this control may be necessary, depending on the stability of the line voltage. When the LINE ADJUST control is correctly set, proper test potentials are applied to the elements of the tube under test.

c. Shorts and Noise Test Circuit. The same circuit is used to test tubes for self-generated noise and for interelectrode shorts.

(1) A short between any two elements of the tube under test will cause neon SHORTS lamp E101 to glow. The SHORTS section of FUNCTION SWITCH S109 is used to select any tube electrode and to test it for shorts to all other elements. In some instances, certain elements within a vacuum tube are intentionally shorted together. Refer to the test data book on the cover of the test set before discarding a shorted tube.

(2) Noise generated within a tube is often caused by the vibration of loose tube elements or by intermittent contact between elements. When tube elements vibrate, or when intermittent disturbances between elements are too brief to cause the neon lamp to indicate a short, an audible means can be used to detect the noise produced (para 22, TM 11-6625-274-12). The SHORTS section of the FUNCTION SWITCH is also used for the noise test.

d. Rectifier Test Circuit. The quality of diode detectors and vacuum tube rectifiers is checked by measuring the dc emission of the tube under static conditions. Cold cathode-type tubes are tested similar to diode detectors and vacuum tube rectifiers, except a higher voltage is applied to the tube. Various fixed test voltages are selected by pushbuttons 2 — DIODE, 6 — OZ4, and 7 — RECT. The amount that the pointer of meter M101 deflects is a measure of the efficiency of electron emission of the tube.

e. Mutual Conductance Test Circuit. This

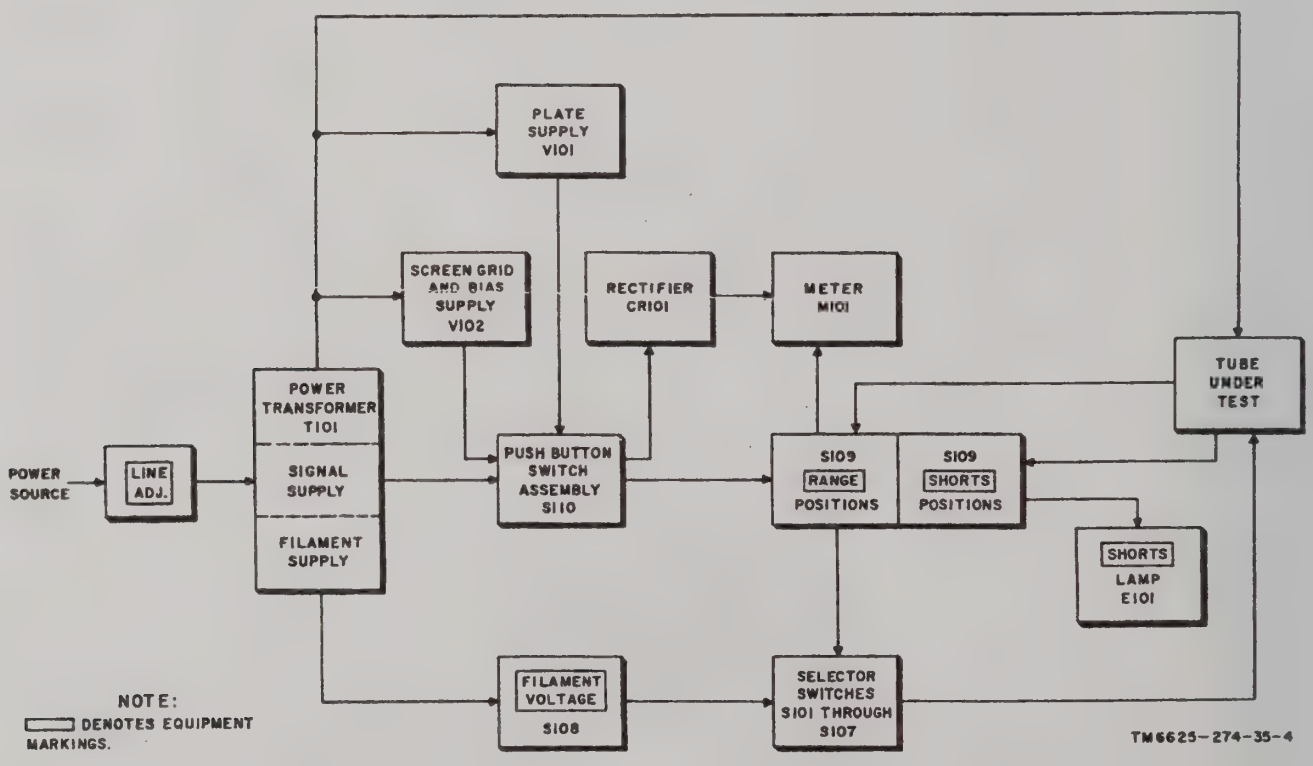


Figure 2. Test Set, Electron Tube TV-7(*)/U, block diagram.

circuit gives an indication of the overall merit of amplifier tubes under simulated operating conditions, by measuring the mutual conductance (G_m) of the tube under test. When pushbutton 3 — MUT. COND. is depressed, the mutual conductance of the tube is indicated on meter M101 in terms of arbitrary units from 0 to 120. To convert the numerical value of the meter reading to mutual conductance in micromhos, refer to paragraph 20, TM 11-6625-274-12.

f. Gas Test Circuit. This circuit is used to check for the presence of excessive amounts of gas in vacuum-type tubes. Excessive gas is indicated by a change in the position of the meter pointer due to the shift in the operating points of the tubes because of gas current in the grid-to-cathode circuit. The gas test is performed by depressing first pushbutton 4 — GAS 1, then pushbutton 5 — GAS 2.

5. Basic Theory of Mutual Conductance Test

To better understand the function and operation of the mutual conductance test circuit used in this test set, a brief review of the basic principles used follows.

a. The two secondary windings of the transformer (fig. 4), which are energized from a 60-cycle power source, supply plate voltage to the full-wave rectifier tube. The inner end of each secondary winding connects to one side of a dc milliammeter (IG). A center-tapped resistor, R_M, is shunted across the milliammeter. The load, resistance R_L, is connected between the center tap of the transformer (momentarily neglecting resistor R_M) and the cathode of the rectifier, as in common full-wave rectifier circuits. When plate 2 is positive with respect to the cathode, electrons flow through the upper half of resistor R_M and through R_L to the cathode, causing the meter pointer to deflect in one direction. When plate 1 is positive with respect to the cathode, electrons flow through the lower half of resistor R_M and through R_L to the cathode, causing the meter pointer to deflect in the opposite direction. With the load resistance fixed and with equal forces acting upon the meter each time the tube conducts, the meter pointer will indicate zero. The pointer cannot follow the current variations

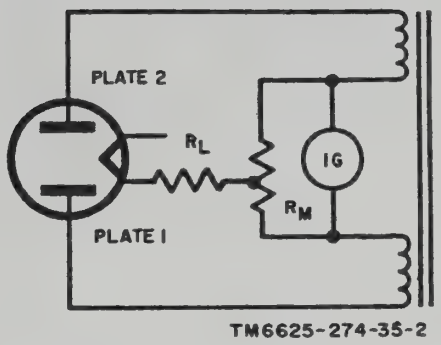


Figure 4. Rectifier diagram.

at the rate of conduction of the tube because of the inertia of the meter movement.

b. If the amplifier tube to be tested is substituted for the fixed load resistance and a fixed bias voltage E is applied to the tube (fig. 5), the meter will still indicate zero because the amplifier tube, under steady-state conditions, acts like a fixed resistance.

c. If, in addition to the bias voltage, an ac potential is applied between the control grid and the cathode of the tube under test, the circuit becomes equivalent to the one used for mutual conductance tests in the TV-7(*)/U. When the ac potential causes the bias voltage between the control grid and the cathode to become less negative, plate current through the tube will increase. Since the plate-cathode resistance has decreased, more current will flow through resistor R_M, and the deflecting force on the pointer of the meter will be greater than before the ac potential was applied. When the ac potential causes the bias voltage between the control grid and the cathode to become more negative on the other half cycle, the resistance of the tube under test will increase, plate current will decrease, and the deflecting force on the meter pointer will be less. With unbalanced current flow through the meter on adjacent half cycles and consequent unequal forces applied to the pointer of the meter, the deflection of the pointer will be proportional to the difference between the currents. Since the difference between the currents was created by the ac potential applied between the control grid and the cathode, the meter pointer will indicate the plate current changes produced by the applied grid voltage change. The meter, therefore, will indicate the mutual conductance (para 10*a*) of the tube under test.

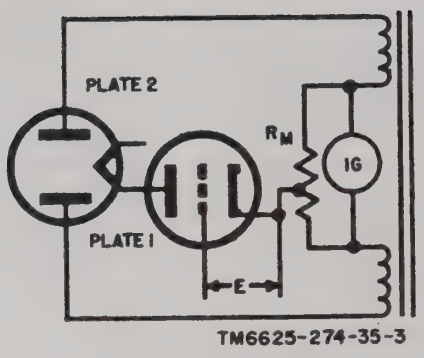


Figure 5. Basic mutual conductance circuit.

Section III. CIRCUIT THEORY

6. Power Supply Circuits

(fig. 3 and 42–44)

a. General. Input power to the primary of transformer T101 is supplied from a 105- to 125-volt ac, 50- to 1,000-cycles-per-second (cps) power source through FUSE lamp E103, POWER switch S111, and LINE ADJUST control R126 (A, fig. 3). The LINE ADJUST control (a rheostat), operated in conjunction with the line voltage test circuit (para 7), adjusts the voltage across the primary of transformer T101 to 93 volts ac.

b. Plate Supply. Plate rectifier tube V101 is a type 83 mercury vapor rectifier tube connected in a full-wave rectifier circuit. Secondaries No. 1 and No. 2 supply approximately 154 volts ac to the plates of the tube. Filament voltage is supplied by 5-volt secondary No. 6. The unfiltered, pulsating dc plate voltage output from the filament-cathode of tube V101 is tapped off at the center tap of secondary No. 6. Secondary No. 2 is tapped at 20 volts to supply voltage, through current limiting resistor R117, for emission tests on certain diode tubes.

c. Screen and Bias Supply. Secondary No. 4, 330 volts center tapped, supplies voltage to the plates of screen and bias rectifier tube V102, a type 5Y3WGTA (para 2*b*) rectifier tube, which is connected in a full-wave rectifier circuit. Filament voltage is supplied to V102 by secondary No. 5. A voltage divider (B, C, or D, fig. 3) is connected between terminals 4 and 17 of T101. The voltage divider provides bias voltage for mutual conductance tests and screen grid voltage (when required) for the tube under test. When V102 conducts, current flow through R129 and R130 (and R133 (B, fig. 3)) produces a voltage drop across each resistor with a polarity as shown in B, C, and D of figure 3.

(1) The bias voltage applied to the tube under test, determined by the setting indicated in the test data book, can be varied by rotating the BIAS control knob on the front panel of the test set. This relocates the tap on resistor R129, thereby changing the difference in potential between the control grid and the cathode of the tube.

(2) The normal screen grid voltage is +130 volts dc. If this voltage is too high for the tube under test, a lower screen grid voltage can be applied to the tube by depressing pushbutton 2 — DIODE. When pushbutton 2 — DIODE is depressed, the screen grid is disconnected from tap B on resistor R130 and is connected to tap A. The TV-7A/U, serial numbers 1 through 1200, also uses voltage-dropping resistor R133 (B, fig. 3) to reduce the screen grid voltage to a suitable value.

(3) When the RANGES F position of the FUNCTION SWITCH is used, variable resistor R139 is connected in parallel with R129, and R140 is connected in series with R129. The addition of R139 and R140 (D, fig. 3) reduces the current through the voltage divider. The voltage drop across R130 is slightly decreased; the voltage drop across BIAS control R129 is greatly decreased, primarily due to adding a low resistance in parallel with the control.

(4) Secondary No. 3 (A, fig. 3) supplies a 5-volt ac signal voltage for mutual conductance tests. A voltage divider network consisting of R120, R121, and R122 (fig. 42-44), connected across this winding, also provides signal voltages of 1 volt and 0.5 volt, depending on the resistor or resistors used.

d. Filament Supply. Secondary No. 7 of T101 (A, fig. 3) supplies filament voltage to the tube under test and voltage for rectifier emission tests. Terminals 19 through 37 provide voltages from 0 volt to 117 volts, under load. No-load voltages will be slightly higher. As an example, the no-load voltage measured between terminals 19 and 37 will be approximately 121 volts with 93 volts across the primary. FILAMENT VOLTAGE switch S108 is used to select the desired filament voltage for the tube under test. The BLST. position of switch S108 enables ballast tubes to be tested for continuity, and supplies voltage to certain rectifier tubes for emission tests. Center-tapped resistor R110 prevents injection of the filament voltage into the grid signal voltage.

7. Line Voltage Test Circuit
(fig. 3 and 42-44)

The line voltage test circuit consists primarily of a bridge circuit connected parallel to terminals 19 and 37 of transformer T101. Meter M101, which can be switched into the bridge circuit, provides an indication of the proper adjustments of LINE ADJUST control R126.

a. The ac voltage between terminals 19 and 37 of T101 is applied to the rectifier bridge circuit through part of switch S110-1 and resistors R134 (TV-7B/U and TV-7D/U only) and R124. The rectifier bridge circuit, except for the TV-7A/U, consists of copper oxide rectifier CR101 and bridge-balancing resistors R123 and R125. On the TV-7A/U (fig. 42 and 43), in addition to bridge-balancing resistors R123 and R125, when meter shunt resistors R131 and R132 are used they are also part of the rectifier bridge circuit and are connected in parallel with copper oxide rectifier CR101. Resistors R131 and R132 are added to the bridge circuit, as required, during initial calibration of the line adjust circuit.

b. When pushbutton 1 — LINE ADJ. is depressed, meter M101 and filter capacitor C103 are connected in parallel with copper oxide rectifier CR101 and bridge-balancing resistors R123 and R125 (and meter shunt resistors R131 and R132, when used, on the TV-7A/U). At the same time, the rectifier bridge circuit is connected between terminals 19 and 37 of T101 through voltage-dropping resistor R124 and variable resistor R134 (TV-7B/U and TV-7D/U only).

(1) On the TV-7/U and TV-7A/U, the value of voltage-dropping resistor R124 is such that, when 121 volts ac (no load) exists between terminals 19 and 37 of transformer T101, and pushbutton 1 — LINE ADJ. is depressed, the meter pointer will indicate at LINE TEST.

(2) On the TV-7B/U and TV-7D/U, the value of resistors R124 and R134 are such that, when 121 volts ac (no load) exists between terminals 19 and 37 of T101 and variable resistor R134 is properly adjusted, the meter pointer will indicate at LINE TEST when pushbutton 1 — LINE ADJ. is depressed.

c. When power is applied to the test set and the setting of resistor R126 is varied, the voltage across the primary and the secondaries of T101 will change. The meter pointer should indicate at LINE TEST when pushbutton 1 — LINE ADJ. is depressed and resistor R126 is properly adjusted.

d. Current flow through the line voltage test circuit is as follows:

(1) When terminal 37 of T101 is negative with respect to terminal 19, the right-hand part of CR101 will conduct and the left-hand part of CR101 will not conduct. Current will flow from terminal 37 through one part of switch S110-1, variable resistor R134 (TV-7B/U and TV-7D/U only), and voltage-dropping resistor R124 to the junction of R123 and R125. The current will divide at this point. Some of the current will flow through R125; the remainder of the current will flow through R123, part of switch S110-1, meter M101 and filter capacitor C103, and another part of switch S110-1.

The total current in the circuit will flow through the right-hand part of CR101.

(2) When terminal 19 is negative with respect to terminal 37, the left-hand part of CR101 will conduct and the right-hand part of CR101 will not conduct. Current will flow from terminal 19 through the left-hand part of CR101 to the junction of R123 and one part of switch S110–1. The current will divide at this point. Some of the current will flow through R123; the remainder of the current will flow through part of switch S110–1, meter M101 and filter capacitor C103, another part of switch S110–1, and R125. The total current in the circuit will flow through R124, variable resistor R134, and one part of switch S110–1 to terminal 37 of T101.

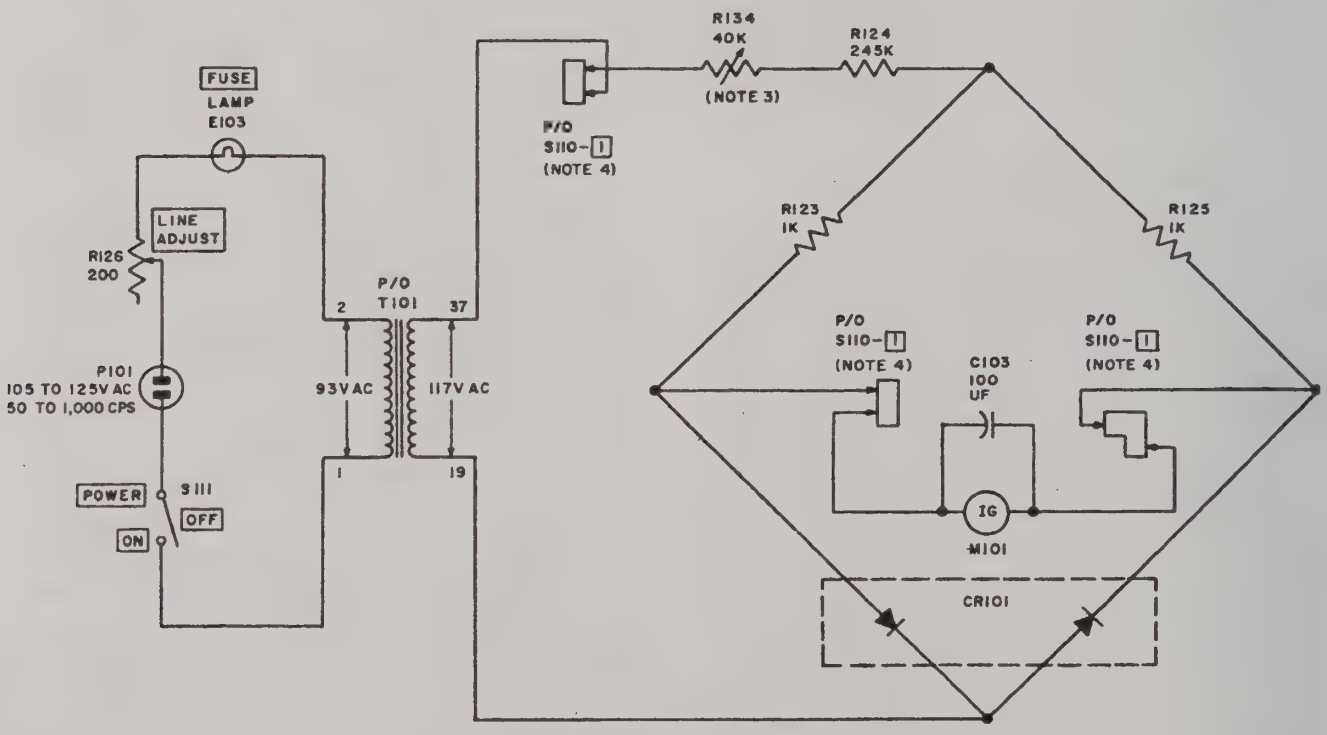
8. Shorts and Noise Test Circuit

(fig. 7 and 42–44)

a. Shorts Test Circuit.

(1) The voltage across secondary No. 2 of transformer T101 is applied to a voltage divider consisting of resistors R107 and R108 (fig. 7). The voltage across R107 is applied to the elements of the tube under test through C102 and R109 and C105. Neon SHORTS lamp E101 is in parallel with C105 and R109. Capacitor C105 and resistor R109 eliminate internally generated harmonics that are a result of operating the test set on input line frequencies higher than 60 cps.

(2) The voltage across R107 is applied to the elements of the tube under test when the selector switches are properly set and the FUNCTION



NOTES:
1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS.
2. ON TV-7A/U, RESISTORS R131 AND R132 ARE EACH CONNECTED PARALLEL TO RECTIFIER CR101.
3. VARIABLE RESISTOR R134 IS USED ONLY ON TV-7B/U AND TV-7D/U.
4. SWITCH S110-1 IS SHOWN DEPRESSED.
5. ▭ DENOTES EQUIPMENT MARKING.

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Figure 6. Simplified line voltage test circuit.

SWITCH is turned from positions 1 through 5. A short between two or more elements of the tube under test will complete the circuit between C102 and R109, C105, and the neon SHORTS lamp. The voltage applied to the SHORTS lamp will cause the gas to ionize, thereby producing a visual indication of an interelement short.

(3) If the polarity of the applied voltage is such that terminal 13 of T101 is negative with respect to terminal 11, and a short exists between two elements of the tube under test, the current flow will be as follows:

(*a*) The total current in the circuit will flow from terminal 13 of T101 through R108 to the junction of C102 and R107. The current will divide at this point. Some of the current will flow through R107 to terminal 11 of the transformer; the remainder of the current will flow through C102 and across the short within the tube under test to the junction of C105, R109, and SHORTS lamp E101. The reactance of C105 and the resistance of R109 are very high compared with the resistance of the conducting SHORTS lamp. The majority of the current, therefore, will flow through the SHORTS lamp to terminal 11 of T101.

(*b*) When terminal 11 of T101 is negative with respect to terminal 13, current will flow to the junction of resistors R107 and R109, capacitor C105, and SHORTS lamp E101. Some of the current will flow through R107 to the junction of R108 and C102; the majority of the remaining current will flow through the SHORTS lamp, across the shorted elements within the tube under test, and through C102 to the junction of resistors R107 and R108. The total current in the circuit will flow through R108 to terminal 13 of T101.

b. Noise Test Circuit. The shorts test circuit is also used when testing a tube for noise. NOISE test jacks J103 and J104 are used to connect a radio receiver or an audio amplifier (para 22, TM 11-6625-274-12) in parallel with SHORTS lamp E101 through isolating capacitor C101. Intermittent disturbances between the tube elements can often be made to occur by tapping a tube. Momentary shorts, which are too brief to be indicated by the SHORTS lamp, permit the alternating voltage across R107 to be applied to the neon lamp and cause a brief oscillation. The oscillations are reproduced and amplified by the radio receiver or the audio amplifier and are heard as an audible signal similar to static.

9. Rectifier Test Circuit

(fig. 8, 9, and 42-44)

The rectifier test circuits in the TV-7(*)/U are similar to the simplified rectifier test circuit shown in figure 9.

a. The circuit shown in figures 8 and 9 is used when the rectifier tube under test is supplied with a test voltage of 35 volts ac.

(1) Some diode tubes, such as the 6H6, use a test voltage of only 20 volts ac, which is supplied by part of secondary No. 2 of T101 (fig. 42-44). The actual voltage applied between the plate and the cathode is approximately 18 volts ac because of a voltage drop across current limiting resistor R117.

(2) A test voltage of approximately 287 volts ac is applied to rectifier tubes of the cold cathode type, such as the OZ4.

(3) Because of the different voltages required to test various types of diodes, the test circuits will necessarily be slightly different from the circuit shown in figures 8 and 9.

b. Filament voltage is supplied to the rectifier tube under test (fig. 8 and 9) from terminals 19 and 27 of transformer T101. When pushbutton switch S110-7 is depressed, 35 volts ac is applied between the cathode and the plate of the tube under test. The tube will conduct only when the plate is positive with respect to the cathode, thereby producing a pulsating dc flow through the circuit. The current through meter M101 is proportional to the electron emission of the tube, and the amount of deflec-

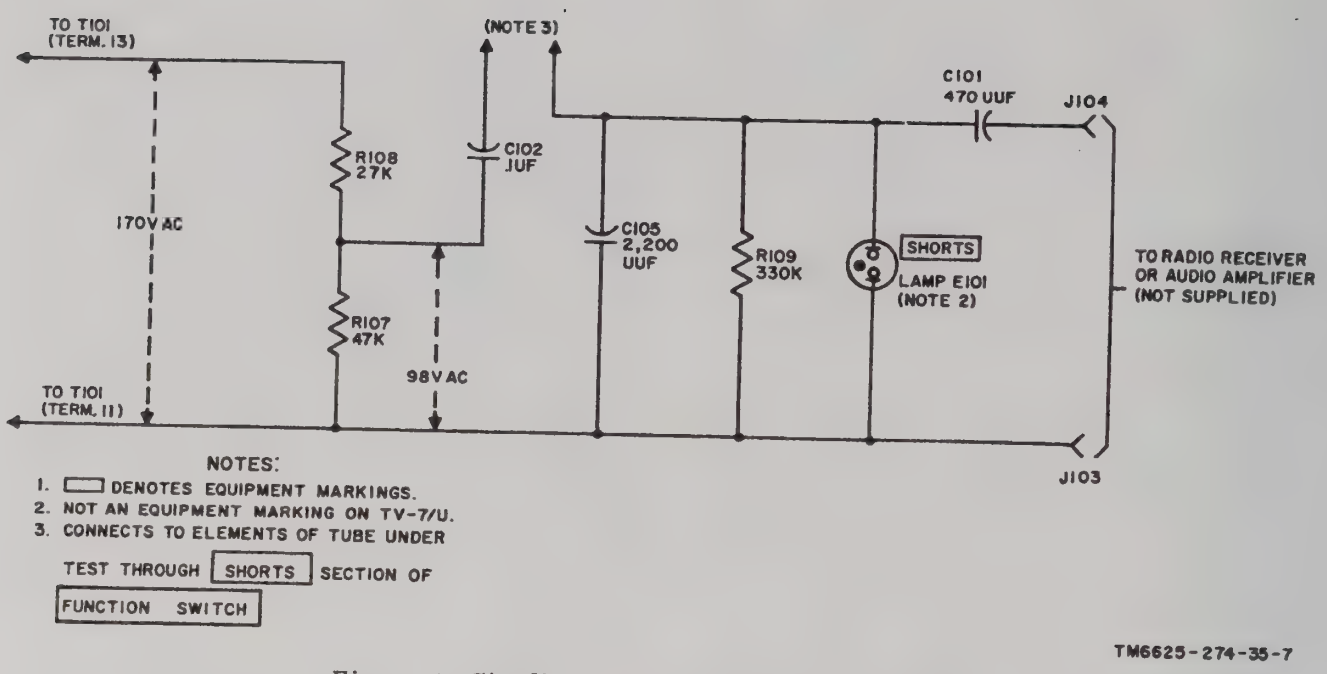


Figure 7. Simplified shorts and noise test circuit.

tion of the meter pointer is a measure of the efficiency of electron emission of the tube.

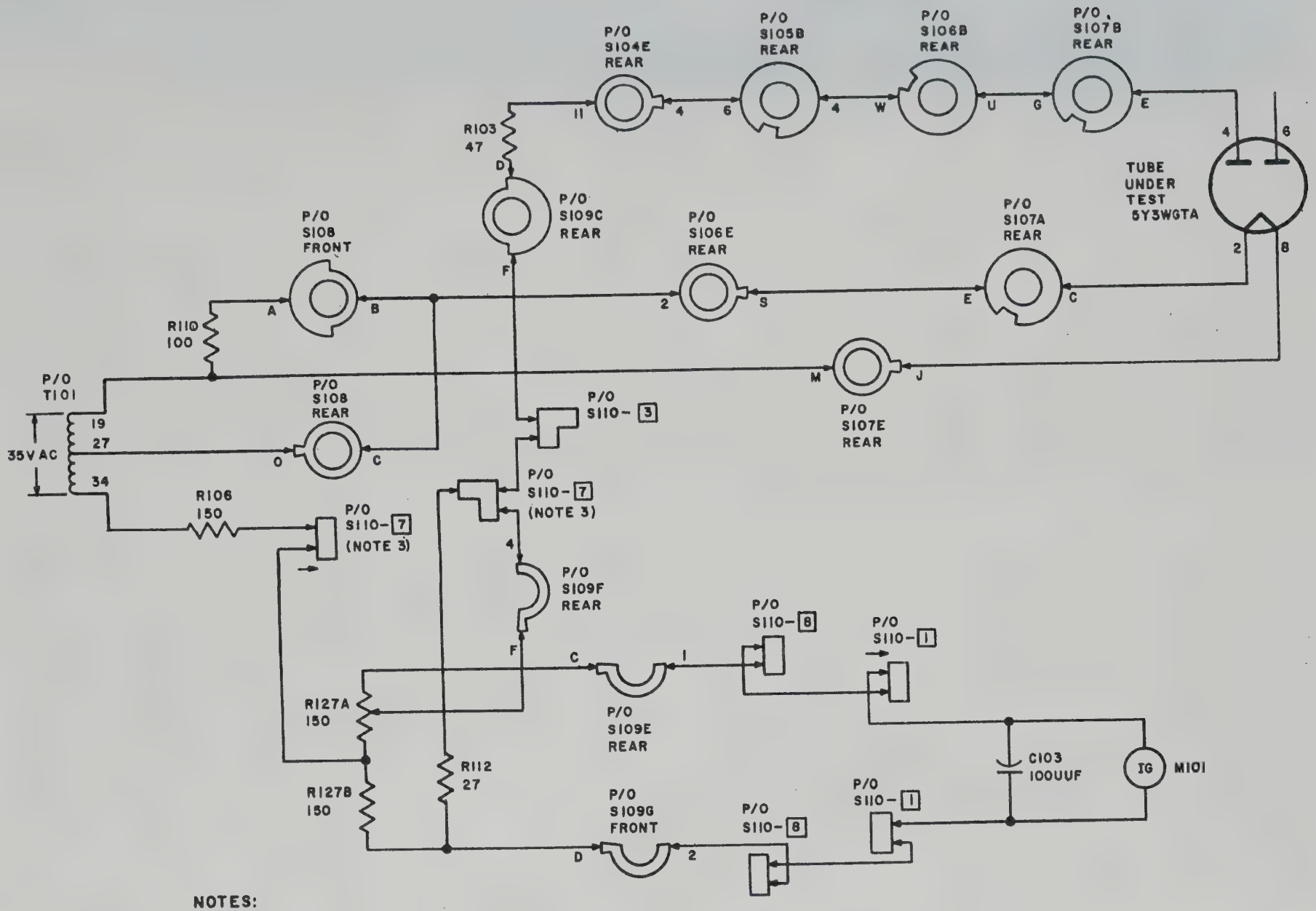
c. The partial schematic diagram (fig. 8) shows the various switch sections used, and the contacts made, to test a type 5Y3WGTA electron tube. Refer to the simplified circuit (fig. 9) for the operation of the circuit (*d* below).

d. When the polarity of the applied voltage is such that terminal 34 is positive with respect to terminal 19, current flow will be as follows:

(1) Filament current will flow from terminal 19 of transformer T101 to the junction of R110 and pin 8 of the 5Y3WGTA under test. The current will divide at this point. Some of the current will flow through R110; the remainder of the current will flow through the filament-cathode of the tube to the other side of R110. The total filament current will return to terminal 27 of the transformer.

(2) When pushbutton switch S110–7 is depressed and an ac voltage is applied between the plate and the cathode of the tube, plate current will flow from the cathode to the plate (pin 4) and through current limiting resistor R103 to pushbutton switch S110–7, where the current will divide. Some of the current will flow through R112; the remainder of the current will flow to the slider arm of R127A, where the current will divide again. Some of the current will flow through resistor R127A to the junction of R127A and R127B; the remainder of the current will flow through the small resistance between the slider arm and the other end of R127A, and through C103 and M101. The meter pointer will indicate the efficiency of electron emission of the tube. The current from C103 and M101 will combine with the current from R112, and will flow through R127B to the junction of R127B and R127A. The total current in the circuit will flow through load resistor R106 to terminal 34 of T101.

(3) When terminal 34 of T101 is negative with respect to terminal 19, filament current will flow from terminal 27 to the junction of R110 and pin 2 of the 5Y3WGTA under test. The current will divide at this point. Some of the current will flow through R110; the remainder of the current will flow through the filament-cathode of the tube to the other side of R110. The total filament current will return to terminal 19 of the transformer.



NOTES:

1. RESISTANCES ARE IN OHMS.
2. SWITCH CONTACTS MADE WILL VARY WITH THE TYPE OF TUBE UNDER TEST.
3. SWITCH S110-7 IS SHOWN DEPRESSED.
4. ▭ DENOTES EQUIPMENT MARKING.

TM6625-274-35-9

Figure 8. Rectifier test circuit, TV-7D/U, partial schematic diagram.

(4) When terminal 34 of T101 is negative with respect to terminal 19, the plate of the tube is negative with respect to the cathode and no plate current will flow. The damping action of the meter movement results in a relatively constant meter indication even though no current is supplied by the tube under test.

e. Since the tube under test in this instance is a duodiode, each half of the tube must be tested separately. When the selector switches are reset according to the information in the tube test data book, the plate connection to pin 4 is broken and pin 6 is connected into the test circuit.

10. Mutual Conductance Test Circuit

(fig. 10, 11, and 42-44)

a. The mutual conductance (G_m) of an amplifier-type vacuum tube is an indication of the effectiveness of the tube to convert a small change in grid voltage (grid signal) to a large change in plate current. The mutual conductance of a tube is found by dividing the change in plate current (Δi_p) by the change in grid voltage (Δe_g).

b. The plate voltage for the tube under test is supplied by plate rectifier tube V101 (fig. 10 and 11). Screen and bias rectifier tube V102 supplies the screen grid voltage and the bias voltage to the tube under test for a direct measurement of mutual conductance. The bias voltage is adjusted by BIAS control R129. The signal voltage, developed across secondary No. 3 of T101, produces an ac flow through voltage divider resistors R120 through R122. The voltage across all three resistors is applied between the control grid and the cathode of the 6SK7 under test, and acts in series with the dc grid bias. The signal voltage alternately swings the grid voltage more negative or less negative, thereby producing the variable grid voltage (Δe_g) required for a dynamic test.

Note. Other electron tubes may require a smaller signal voltage. When this is the case, switching circuits enable only R120, or R120 and R121, to be connected into the test circuit.

c. The mutual conductance test circuit is actuated by pushbutton switch S110-3 (3 — MUT. COND.). The normal screen grid voltage of +130 volts dc is excessive for testing certain tubes such as the 1R5. In such cases, it is necessary to hold down pushbutton switch S110-2 (2 — DIODE) *before* pushbutton switch S110-3 is depressed. This action breaks the connection between the screen grid of the tube under test and contact A of resistor R130, and connects the screen grid to contact B of R130, which is at a potential of approximately +56 volts dc.

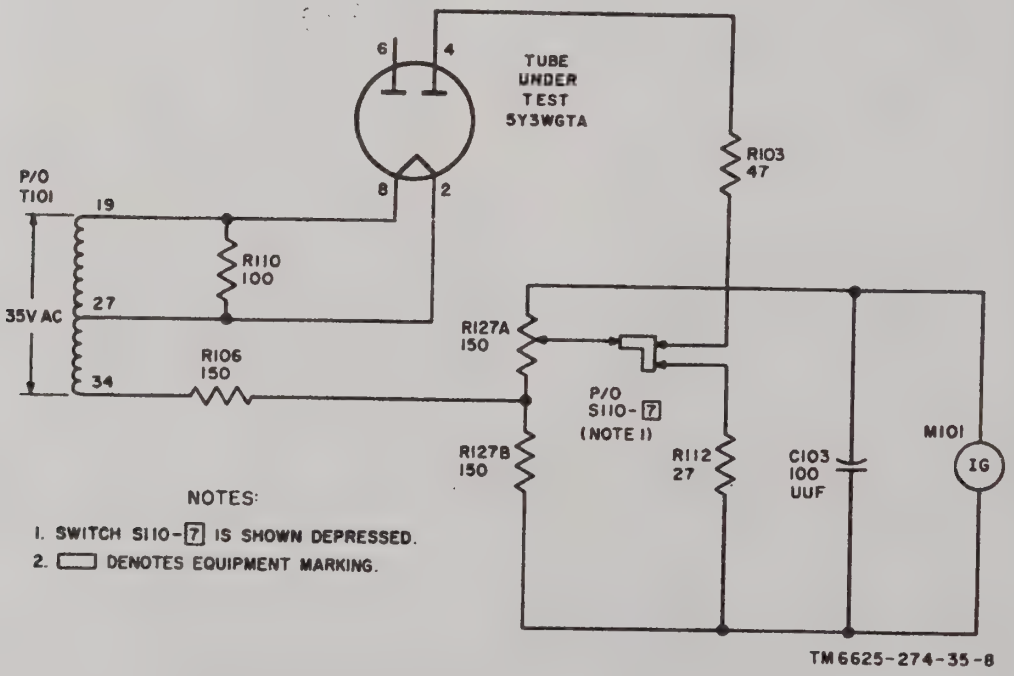


Figure 9. Simplified rectifier test circuit, TV-7D/U.

d. The partial schematic diagram (fig. 10) shows the various switch sections used and the contacts made to test a type 6SK7 electron tube. Refer to the simplified circuit (fig. 11) for the operation of the circuit (*e* below).

e. When pushbutton switch S110-3 is depressed, a voltage of approximately +150 volts dc is applied to the plate of the tube under test.

(1) When the polarity of the voltage across secondary No. 2 of T101 is such that pin 3 of V101 is positive with respect to the cathode of V101, the signal voltage applied between the control grid and the cathode of the tube under test will swing in a positive direction, thereby decreasing the bias and increasing the current flow through the circuit. The increasing current will flow from the cathode to the plate of the 6SK7, through R103, a neutralizing resistor, to the cathode of V101. Current will flow from the cathode of V101 to pin 3 and through secondary No. 2 of T101 to the junction of R111 and R135 in parallel. Current will divide at this point. Some current will flow through R113 and R135 to the cathode of the tube under test; the remainder of the current will flow through R111, M101 and C103 in parallel, R118, and R115 and R137 in parallel, to the cathode of the tube under test. The screen grid will draw some current since it is positive with respect to the cathode. The screen grid current will flow through R102, which is used to suppress oscillations that may be produced by the tube under test, to V102, and back to the cathode of the tube. Resistor R104, in the control grid circuit, is also used to suppress oscillations that may be produced by the tube under test.

(2) When the polarity of the voltage across secondary No. 1 of T101 is such that pin 2 of V101 is positive with respect to the cathode of V101, the signal voltage applied to the tube under test will swing in a negative direction, thereby increasing the bias and decreasing the current flow through the circuit. The decreasing current will flow from the cathode to the plate of the 6SK7 and through R103 to the cathode of V101. Current will flow from the cathode of V101 to pin 2, and through secondary No. 1 of T101 to the junction of R118 and R115 and R137 in parallel. Current will divide at this point. Some current will flow through R115 and R137 to the cathode of the tube under test; the remainder of the current will flow through R118, M101 and C103 in parallel, R111, and R113 and R135 in parallel, to the cathode of the tube under test.

(3) With unbalanced currents flowing through M101 on adjacent half cycles, and unequal forces applied to the meter pointer, the deflection of the pointer will be proportional to the difference between the two currents. The heavier current flow through M101 occurs when pin 3 of V101 is positive with respect to the cathode of V101, and results in an essentially steady, upscale reading on the meter.

11. Gas Test Circuit

(fig. 12)

a. The plate voltage for the tube under test is supplied by secondary No. 2, terminals 11 and 13, of T101. Screen and bias rectifier tube V102 supplies the bias voltage. Since there is no screen grid in the tube under test in this instance, no connection is made to the screen grid voltage supply.

b. When pushbutton switch S110-4 (4—GAS 1) is depressed, a definite value of plate voltage and bias voltage is applied to the tube under test and causes a definite value of plate current to flow. Meter M101 is in the plate-to-cathode circuit of the tube under test and will be actuated by the plate current.

c. When pushbutton switch S110-5 (5—GAS 2) is depressed, grid resistor R128, which was shorted by part of switch S110-5, is inserted into the control grid circuit. If grid current flows from the bias voltage source through the grid circuit to the cathode as shown by the arrows, due to gas in the tube, the grid current will develop a voltage drop across R128 in the direction indicated. A

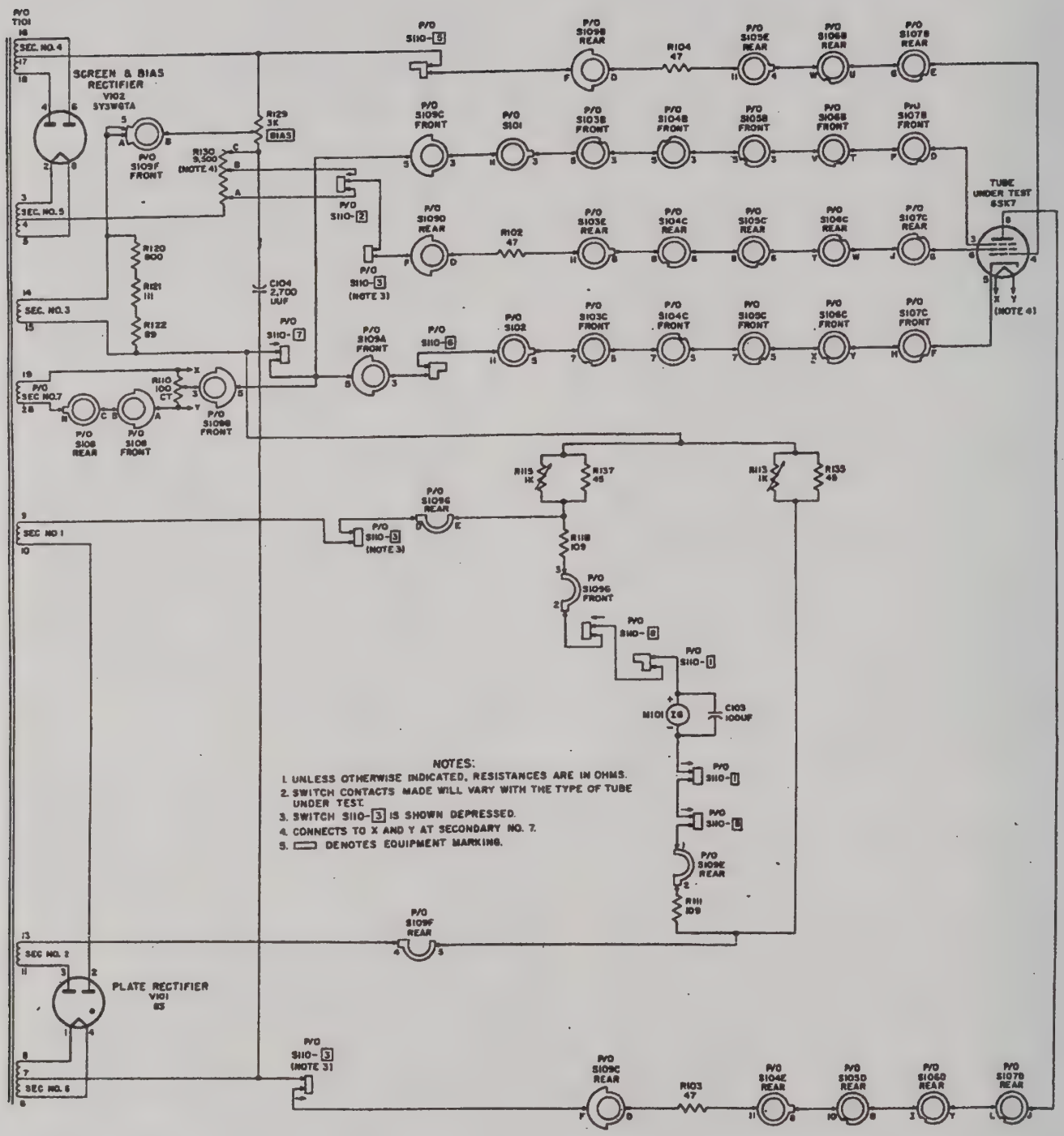


Figure 10. Mutual conductance test circuit, TV–7D/U, partial schematic diagram.

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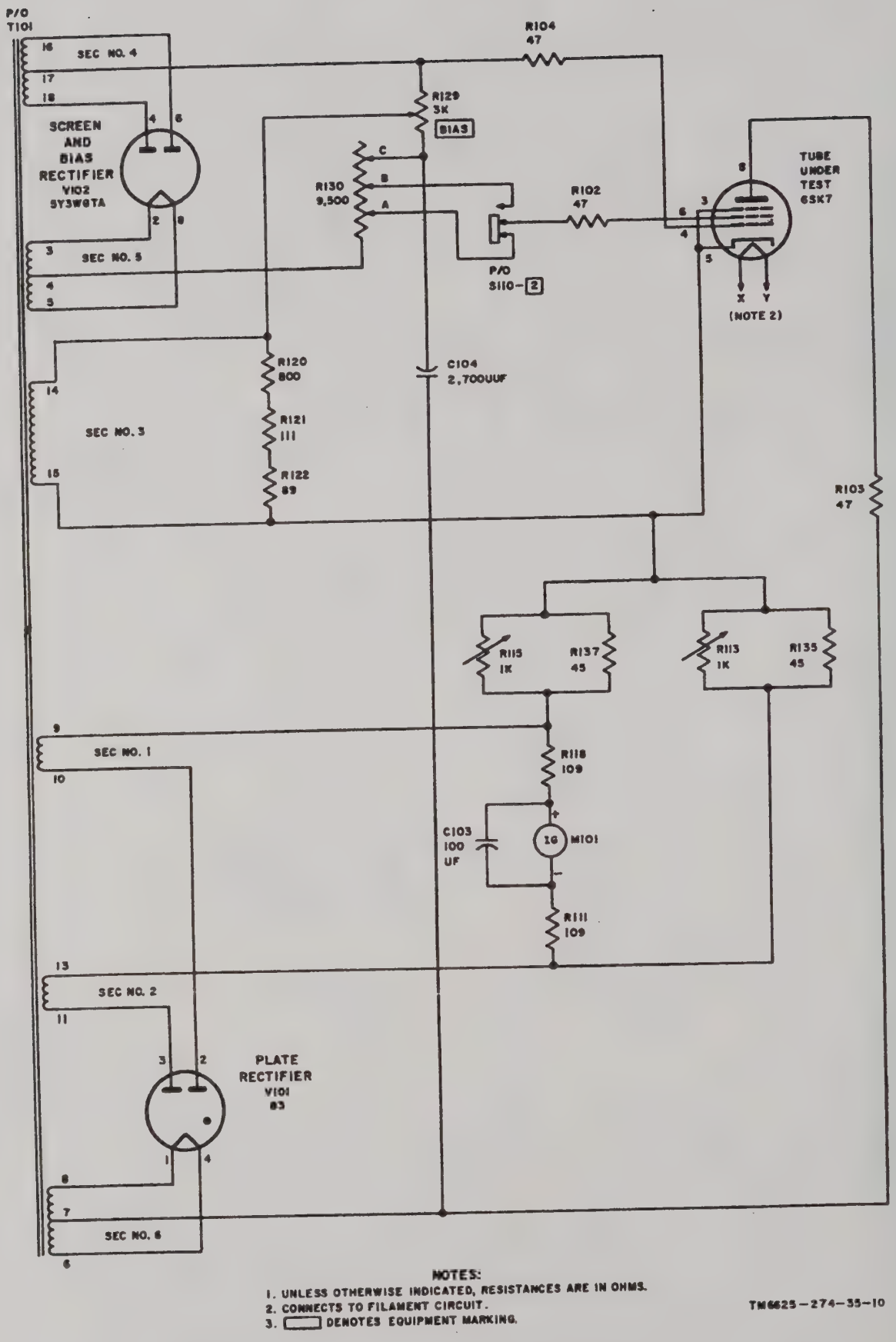


Figure 11. Simplified mutual conductance test circuit, TV-7D/U.

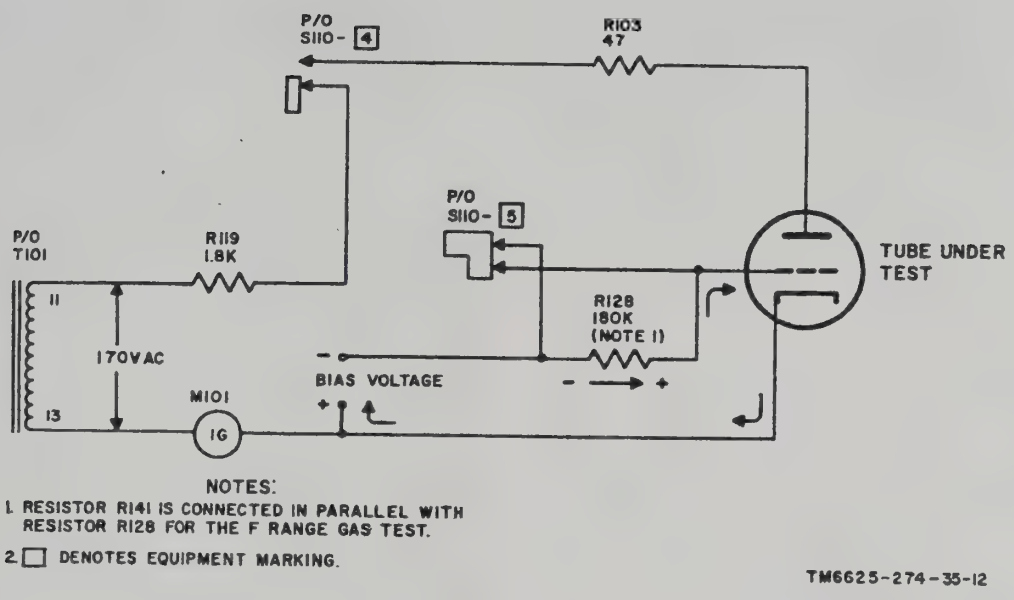


Figure 12. Simplified gas test circuit.

voltage drop across R128 will reduce the negative bias on the grid of the tube and will cause the plate current to increase. The increased plate current must flow through M101 and will cause the meter reading to increase. The increased meter reading should not exceed one scale division.

Note. In the TV-7D/U, resistor R141 is connected parallel to R128 for gas tests when the RANGES F position of the FUNCTION SWITCH is used.

12. Special Switching Circuits

(fig. 13 and 14)

a. Selector Switches.

(1) The selector switches, FILAMENT (S107 and S106), GRID (S105), PLATE (S104), SCREEN (S103), CATHODE (S102), and SUPPRESSOR (S101) are constructed and interconnected so as to eliminate the possibility of applying more than one voltage to any tube pin at the same time, or of creating a shorted condition by accidental disturbance of the switches. The basic principle of this interlocking circuit is shown in figure 13.

(2) Conductors from test socket contacts 1 through 9 enter the switching circuit from the left and progress toward the right through the FILAMENT, GRID, PLATE, SCREEN, CATHODE, and SUPPRESSOR selectors. To simplify the figure, only portions of the first four selectors have been shown.

(a) The left FILAMENT selector is set to apply voltage to pin 1 of the test sockets. This switch setting automatically breaks the conductor from pin 1 at point A, and makes it impossible for any other voltage to reach pin 1 regardless of where the succeeding selectors are set.

(b) The right FILAMENT selector is set to apply voltage to pin 2. The conductor is broken from this pin at point B, and no other voltage can reach pin 2.

(c) When the GRID selector is set to deliver grid voltage to pin 3, the conductor is broken from this pin at point C and the application of any other voltage to pin 3 is prevented.

(d) Setting the PLATE selector to deliver plate voltage to pin 4 breaks the conductor from pin 4 at point D.

(e) If the first four selectors are set in this manner, filament voltage is applied across pins 1 and 2, grid voltage to pin 3, and plate voltage to pin 4, but application of any other voltage to these pins is impossible.

b. Shorts Test Switch. The operation of the SHORTS portion of FUNCTION SWITCH

S109 (fig. 14) shows the shorts test section of the switch in position 1. In this position, the cathode, the filament, and the suppressor grid of the tube under test are in contact with segment Y; the screen grid, the plate, and the control grid are in contact with segment Z. Any shorted condition between an element on segment Y and elements on segment Z completes the circuit between C102 and E101, and SHORTS lamp E101 will glow. Rotation of the switch from position 2 through position 5 changes the grouping of the elements on the two segments. Different types of shorts will cause the neon lamp to glow on different positions of the switch; that is, a screen-to-suppressor short will cause the lamp to glow in all five positions while a control grid-to-plate short will cause a glow only on position 4. The following chart shows the various possible inter-element shorts within a tube and the positions of the FUNCTION SWITCH in which the SHORTS lamp will glow for a particular short:

Kind of short	FUNCTION SWITCH position				
	1	2	3	4	5
Screen to suppressor	X	X	X	X	X
Control grid to cathode	X	X	X		X
Filament to plate	X	X		X	X
Filament to control grid	X	X			X
Filament to screen	X		X	X	X
Plate to suppressor	X			X	X
Control grid to suppressor	X				X
Control grid to screen		X	X	X	
Plate to screen		X	X		
Filament to suppressor		X			
Filament to cathode			X		
Control grid to plate				X	

Note. Multisection tubes must be tested for shorts by individual sections. Data in the shorts test chart above apply to the elements of the sections of these tubes.

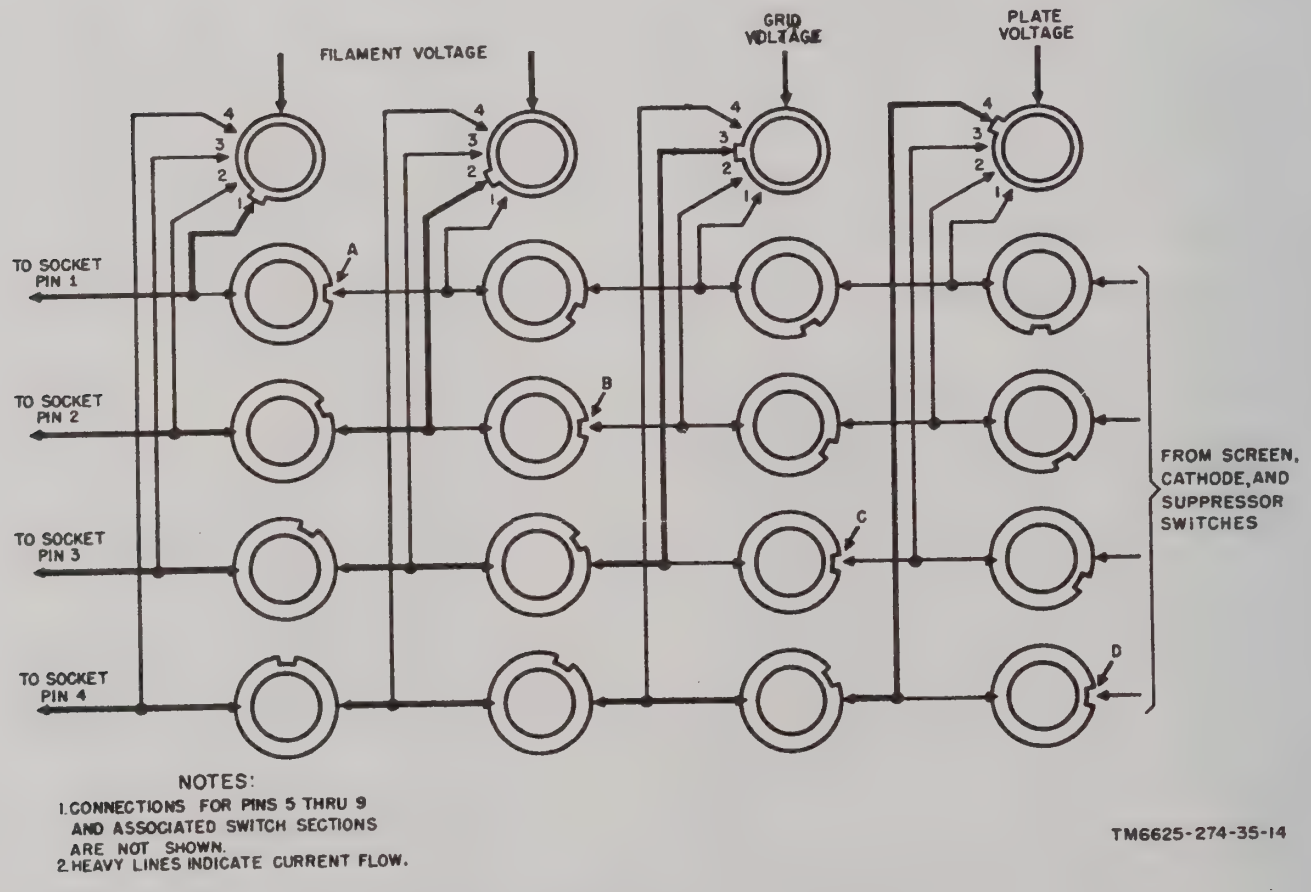


Figure 13. Simplified selector switch diagram.

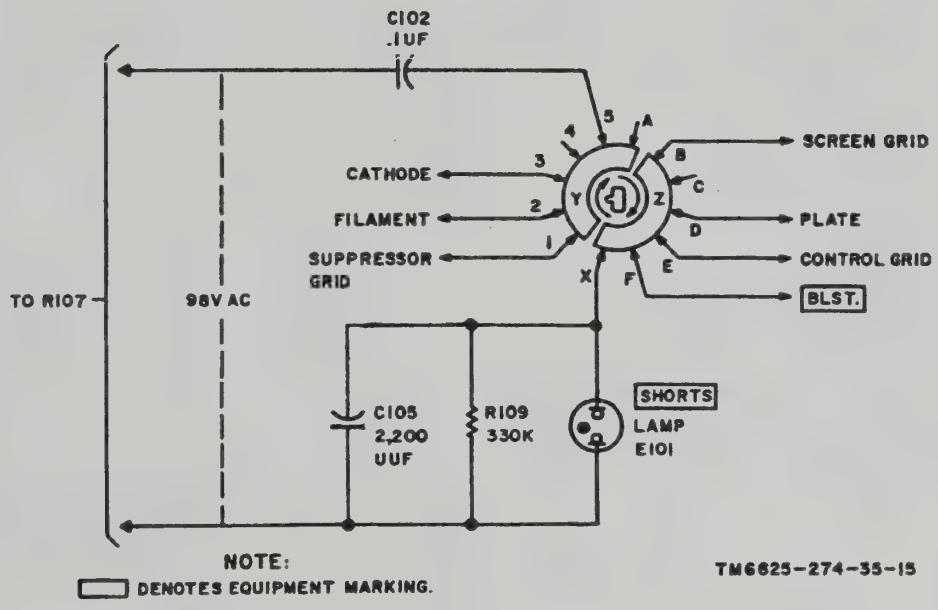


Figure 14. Simplified shorts test switch diagram.

CHAPTER 2
TROUBLESHOOTING

13. General Instructions

Troubleshooting at fourth and fifth echelon maintenance levels includes all the techniques outlined for organizational maintenance (TM 11-6625-274-12) and any special or additional techniques required to isolate a defective part. The field and depot maintenance procedures are not complete in themselves but are supplemented by the procedures described in TM 11-6625-274-12. The systematic troubleshooting procedure, which begins with the checks that can be performed at an organizational level, must be completed by means of additional localizing and isolating techniques.

14. Troubleshooting Procedures

a. General. The first step in servicing a defective test set is to localize the fault to the circuit responsible for abnormal operation. The second step is to isolate the fault to the defective part that is responsible for the abnormal condition. Some faults, such as a burned-out resistor, can often be located by sight or smell. The majority of faults, however, must be localized by checking resistances.

b. Localization. The test set can be used to check pilot lamps, diode tubes, amplifier tubes for G_m, gas, and noise, and to check tubes for shorts. The first step in localizing troubles is to determine the circuit or circuits at fault by the following methods:

(1) *Visual inspection.* The purpose of visual inspection is to locate faults without testing or measuring circuits. All meter readings and other visual signs should be observed to try to localize the fault to a particular circuit.

(2) *Operational tests.* Operational tests frequently indicate the general location of trouble. In many instances, the tests will help in determining the exact nature of the fault. The equipment performance checklist (TM 11-6625-274-12) is a good operational test.

c. Isolation. The checks listed below will aid in isolating the trouble. After the trouble has been isolated to a particular circuit, isolate the trouble within that circuit to a particular part.

(1) *Resistance measurements.* Use the schematic diagram (fig. 42-44) to find the value of the components. Use resistance measurements (para 17 and fig. 33 and 34) to find the value for normal readings, and compare them with the readings taken.

(2) *Troubleshooting chart.* The symptoms listed in the troubleshooting chart (para 16) will aid in localizing trouble to a component part.

(3) *Intermittent troubles.* In all these tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble may often be made to appear by tapping or jarring the equipment. Check the wiring and connections to the test set.

15. Tools and Test Equipment Required

The following chart lists the tools and test equipment required for troubleshooting the test set, the associated technical manuals, and the assigned common names.

Tool or test equipment	Technical manual	Common name
Tool equipment TE-113		Tool equipment
Multimeter TS-352/U	TM 11-5527	Multimeter
Test Set, Electron Tube TV-7(*)/U	TM 11-6625-274-12	Test set

16. Isolating Troubles

a. General. In the troubleshooting chart (*c* below), procedures are outlined for isolating troubles to a particular component part. The adjustment chart (*d* below) indicates the test that is to be performed when certain component parts are adjusted or replaced. Parts locations for the different models of the test set are shown in figures 15 through 32. Re-

sistance values are indicated on the schematic diagrams (fig. 42–44). Depending on the nature of the operational symptoms, one or more of the isolating procedures will be necessary.

b. Use of Chart. The troubleshooting chart is designed to supplement operational checks which can be performed at an organizational level. If previous operational checks have resulted in reference to a particular item of the chart, go directly to the referenced item. If no operational symptoms are known, begin with item 1 of the equipment performance checklist (TM 11–6625–274–12) and proceed until a symptom of trouble appears.

c. Troubleshooting Chart.

Step	Symptom	Probable trouble	Correction
1	Meter pointer deflects beyond full scale when POWER switch is set to ON.	C104 shorted	Replace C104.
2	PILOT lamp does not light when POWER switch is set to ON.	Defective PILOT lamp or lamp loose in socket.	Tighten lamp in socket. Check continuity if lamp does not light.
		Open conductor in ac line cord, open FUSE lamp E103, R126, T101 primary, or defective switch S111.	Set POWER switch to ON and connect ohmmeter between prongs of ac line cord plug. If meter indicates zero, check R126, FUSE lamp E103, switch S111, T101 primary, and each conductor in the ac line cord. Replace as necessary.
		Open secondary No. 7 of T101.	Check for continuity between terminals 22 and 28 of T101. Replace T101 if necessary.
3	Meter pointer will not adjust to LINE TEST mark.	R123 or R125 open	Replace R123 or R125.
		Defective transformer T101	Check resistance of T101 (para 17). Replace T101 if necessary.
		Defective rectifier CR101	Replace CR101.
		Defective meter M101	Check meter and replace if necessary.
4	No meter indication when performing line adjustment check.	Rectifier CR101 or C103 shorted.	Check and replace shorted component.
		R124, R134, (TV–7B/U and TV–7D/U), or secondary No. 7 of T101 open.	Replace R124, R134, or T101.
		Pushbutton switch S110–1 contacts not making properly.	Depress pushbutton 1—LINE ADJ. several times. Clean switch contacts. Replace switch S110 if necessary.
5	SHORTS lamp does not light when checking shorts test circuit (para 17*e*, TM 11–6625–274–12).	R108 or C102 open, or C105 shorted.	Replace R108, C102, or C105.
		Secondary No. 2 of T101 open.	Check and replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.

Step	Symptom	Probable trouble	Correction
			Check continuity through the appropriate section of each switch.
			Adjust defective contact; replace switch if necessary.
6	Meter pointer will not adjust to 10 or to 100 when BIAS control is varied for gas test (TM 11–6625–274–12).	R104 open	Replace R104.
7	Meter does not indicate when pushbutton 2—DIODE is depressed (diode tests only).	R103, R117, R127B, R127A, at end opposite R127A, B junction, or secondary No. 7 of T101 open.	Replace R103, R117, R127A, or R127B.
			Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch.
			Adjust defective contact; replace switch if necessary.
8	Meter reading beyond full scale when pushbutton 3—MUT. COND. is depressed.	R113, R134, (TV–7A/U, serial No. 1201–9492), R135 (TV–7B/U, TV–7D/U) open.	Replace R113, R134 (TV–7A/U, serial No. 1201–9492), or R135 (TV–7B/U, TV–7D/U).
9	Meter does not indicate when pushbutton 3—MUT. COND. is depressed.	R103, R111, R115 (TV–7/U, TV–7A/U, serial No. 1–1200), or R118 open.	Replace defective resistor.
		Open secondary No. 2, 3, or 6 of T101.	Check T101; replace if necessary.
		Defective V101	Replace V101.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch.
			Adjust defective contact; replace switch if necessary.
10	Meter pointer deflects to left, off scale, when pushbutton 3—MUT. COND. is depressed.	R115, R135 (TV–7A/U, serial numbers 1201–9492), R137 (TV–7B/U, TV–7D/U) open.	Replace defective resistor.
11	Meter does not indicate when pushbutton 4—GAS 1 is depressed.	R103, R111, R115, R118, or R119 open.	Replace defective resistor.
		Open secondary No. 2 or 6 of T101.	Check T101; replace if necessary.
		Defective V101	Replace V101.

Step	Symptom	Probable trouble	Correction
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position. Check continuity through the appropriate section of each switch. Adjust defective contact; replace switch if necessary.
12	Meter reading beyond full scale when pushbutton 4—GAS 1 is depressed.	R113, R134, (TV–7A/U, serial numbers 1201–9492), R135 (TV–7B/U, TV–7D/U) open.	Replace defective resistor.
13	Meter reading increases several units when pushbutton 5—GAS 2 is depressed.	R128 or R141 (TV–7D/U, F position of FUNCTION SWITCH), open.	Replace defective resistor.
14	Meter does not indicate when pushbutton 6—OZ4 is depressed.	R103, R119, R127A at end opposite R127A, B junction, or R127B open.	Replace defective resistor.
		Open secondary No. 2 or 7 of T101.	Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position. Check continuity through the appropriate section of each switch. Adjust defective contact; replace switch if necessary.
15	Meter reading beyond full scale when pushbutton 6—OZ4 is depressed.	R112 open	Replace R112.
16	Meter does not indicate when pushbutton 7—RECT. is depressed.	R103, R106, R127A at end opposite R127A, R127B junction, or R127B open.	Replace defective resistor.
		Open secondary No. 7 of T101.	Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position. Check continuity through the appropriate section of each switch. Adjust defective contact; replace switch if necessary.
17	Meter reading beyond full scale when pushbutton 7—RECT. is depressed.	R112 open	Replace R112.
18	Meter reading abnormally high (full scale or beyond) when testing some high-gain electron tubes.	Test circuit is oscillating	Redress the leads from all of the test sockets until correct reading is obtained. *Note.* This may correct the trouble of only a particular tube rather than all high-gain tubes. Several types of high-gain tubes should be tested and the test socket leads redressed until each tube tests correctly.

Step	Symptom	Probable trouble	Correction
19	No voltage at panel lamp test socket.	Open secondary No. 7 of T101	Check T101; replace if necessary.
		Defective switch S106, S107, or S108.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch (fig. 42–44).
			Adjust defective contact; replace switch if necessary.
20	Signal voltage is zero (measured at test socket).	R104, R120, R121, or R122 open.	Replace defective resistor.
		Open secondary 3 of T101	Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch (fig. 42–44).
			Adjust defective contact; replace switch if necessary.
21	Signal voltage is low or high (measured at test socket).	R104, R120, R121, or R122 changed value.	Check resistances; replace defective resistor.
22	Plate voltage is zero (measured at test socket).	V101 defective	Replace V101.
		R103 open	Replace R103.
		Open secondary No. 6 of T101	Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch (fig. 42–44).
			Adjust defective contact; replace switch if necessary.
23	Plate voltage is low (measured at test socket).	V101 defective	Replace V101.
		Open secondary No. 1 or 2 of T101.	Check T101; replace if necessary.
24	Plate voltage is high (measured at test socket).	Open secondary No. 5 of T101	Check T101; replace if necessary.
25	Screen voltage is zero (measured at test socket).	V102 defective	Replace V102.
		Open secondary No. 5 of T101	Check T101; replace if necessary.
		R102, R133 (TV–7A/U, serial numbers 1–1200), or R129 (–) end open.	Replace defective resistor.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch (fig. 42–44).
			Adjust defective contact; replace switch if necessary.

Step	Symptom	Probable trouble	Correction
26	Screen voltage is low (measured at test socket).	V102 weak	Replace V102.
		Open secondary No. 3 or 4 of T101.	Check T101; replace if necessary.
27	Screen voltage is high (measured at test socket).	R129 open at (+) end or R130 open.	Replace defective resistor.
		Open secondary No. 6 of T101	Check T101; replace if necessary.
28	Bias voltage is zero (measured at test socket).	R104, R129, R130, or R133 (TV-7A/U, serial numbers 1–1200) open.	Replace defective resistor.
		V102 defective	Replace V102.
		Open secondary No. 5 of T101	Check T101; replace if necessary.
		Defective selector switch contact.	Rotate each selector switch knob and reset to test position.
			Check continuity through the appropriate section of each switch (fig. 42–44).
			Adjust defective contact; replace switch if necessary.
29	Bias voltage is low (measured at test socket).	V102 weak	Replace V102.
		Open secondary No. 3 or 4 of T101.	Check T101; replace if necessary.

d. Adjustment Chart.

Component adjusted or replaced					Test
	TV-7A/U				
TV-7/U	Serial numbers 1 through 1200	Serial numbers 1201 through 9492	TV-7B/U	TV-7D/U	
CR101 or R124	CR101 or R124	CR101 or R124	CR101, R124, or R134	CR101, R124, or R134	Line adjust circuit (para 23)
R129 or R130	R129, R130, or R133	R129 or R130	R129 or R130	R129 or R130	Plate (para 23) and screen grid (para 24) voltage
R113 or R115	R113 or R115	R113 or R115	R113 or R115	R113 or R115	Simulated tube test (para 26)
R127	R127	R127	R127	R127	Shunt control (para 27)
R114	R114	R114	R114	R114	RANGES C of FUNCTION SWITCH (para 28)
				R139	Bias voltage (para 22)

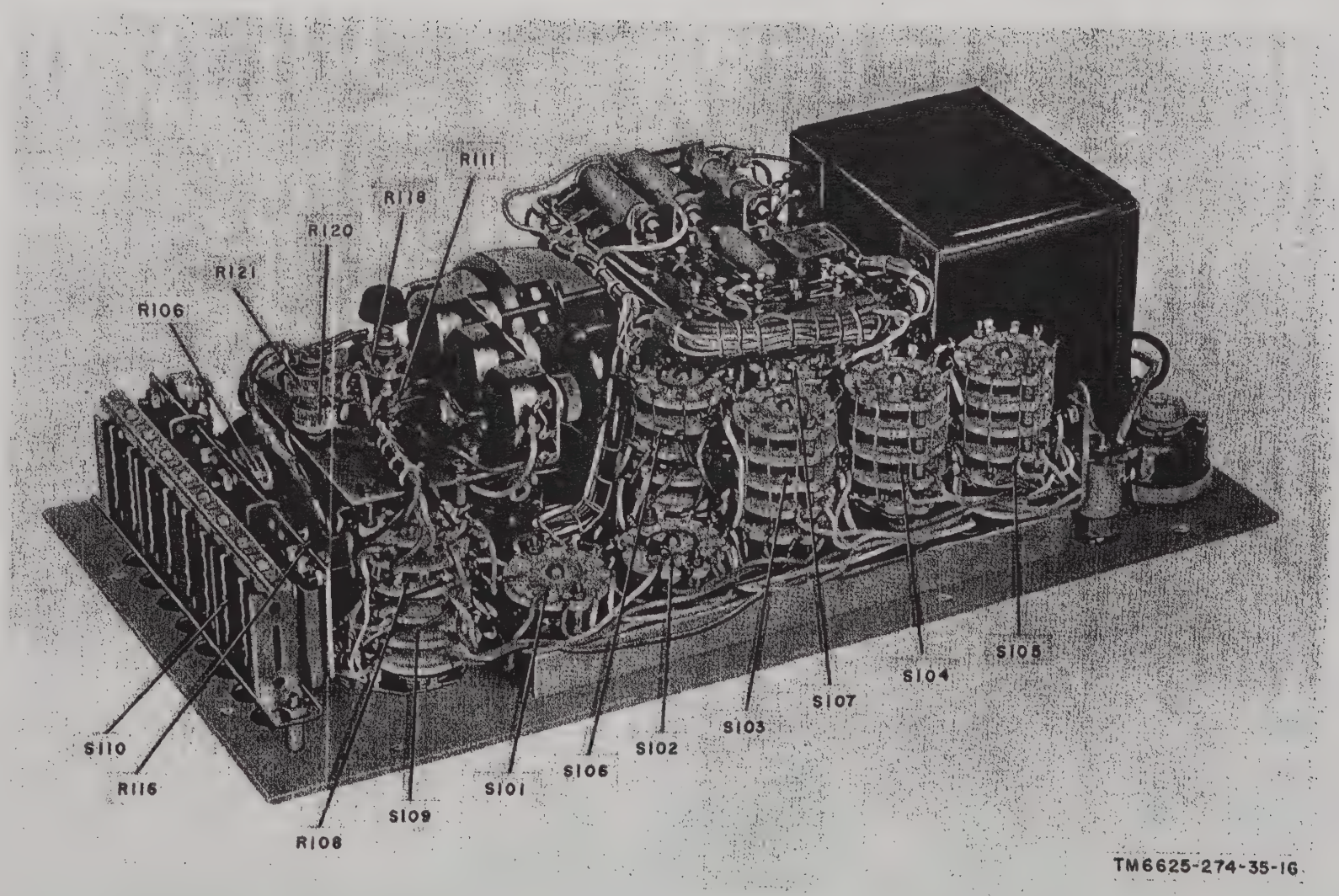


Figure 15. Test Set, Electron Tube TV–7A/U (serial numbers 1 through 1200), front-left oblique.

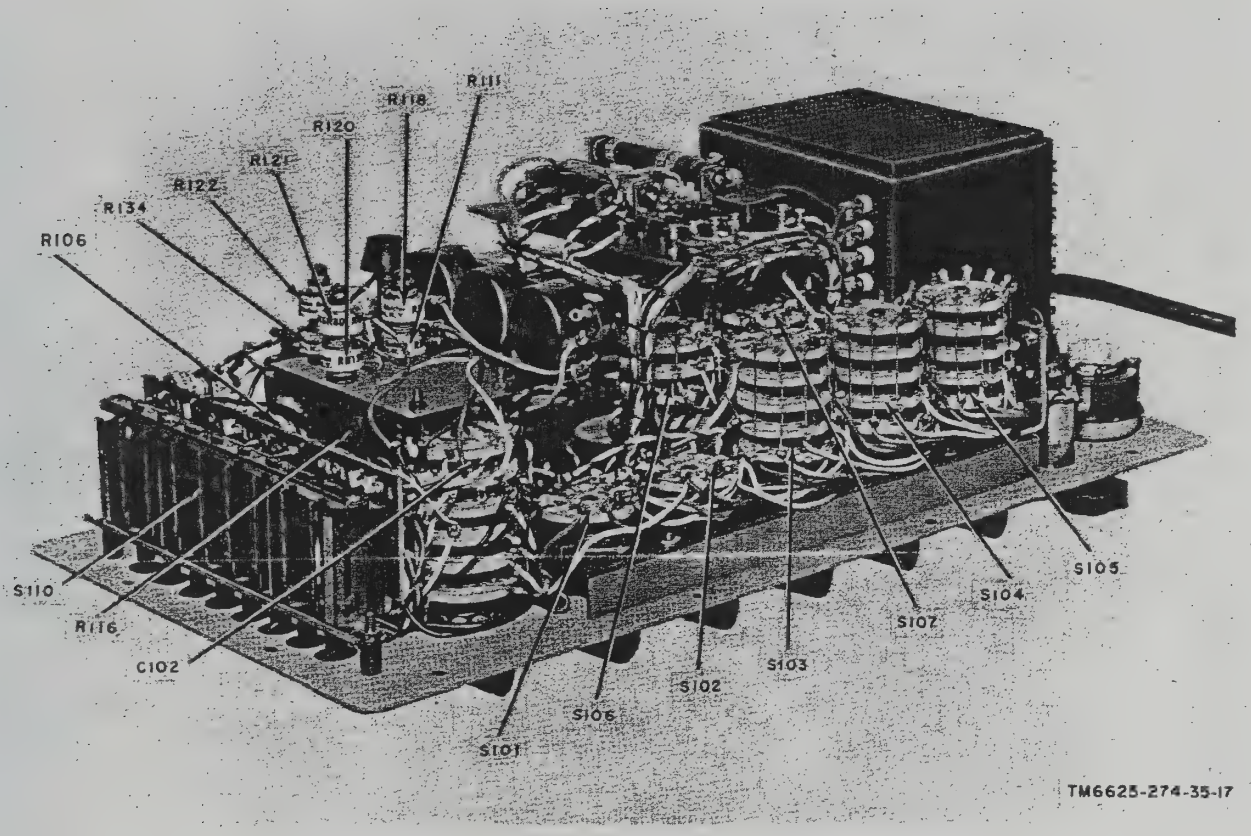


Figure 16. Test Set, Electron Tube TV–7A/U (serial numbers 1201 through 9492), front-left oblique.

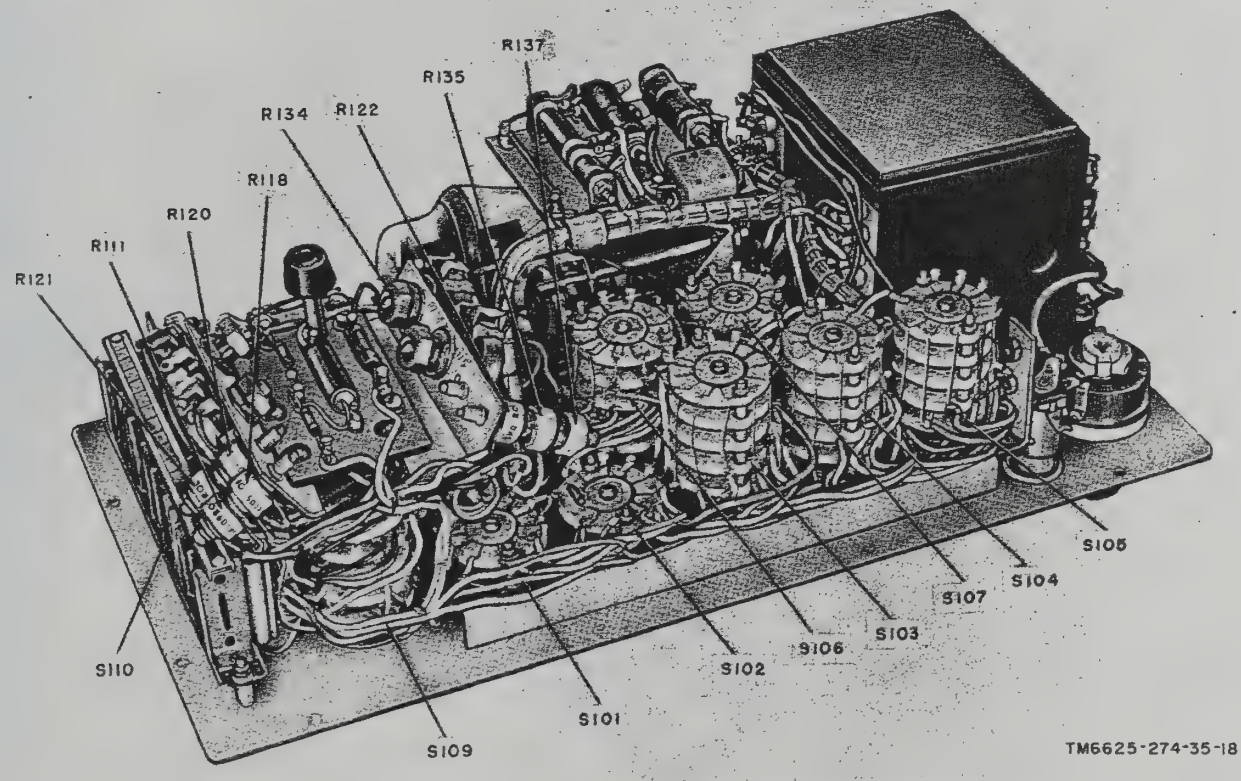


Figure 17. Test Set, Electron Tube TV–7B/U, front-left oblique.

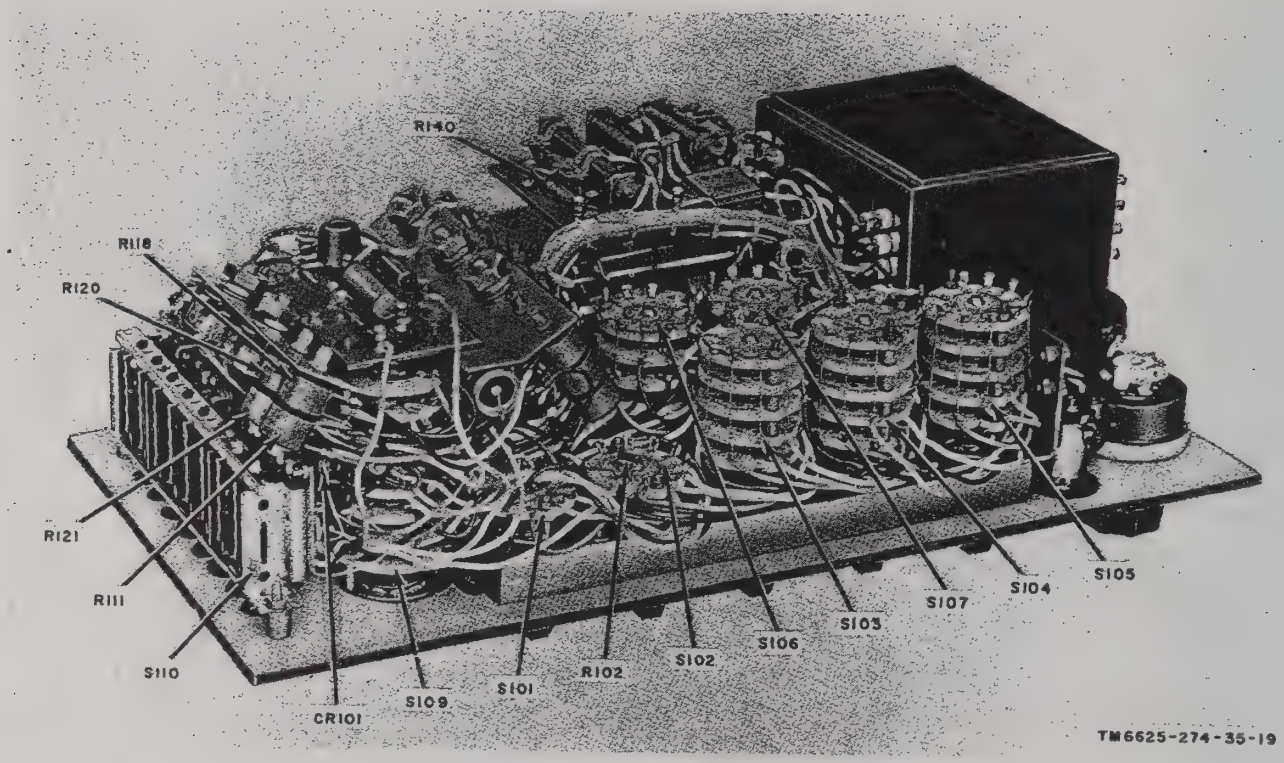


Figure 18. Test Set, Electron Tube TV–7D/U, front-left oblique.

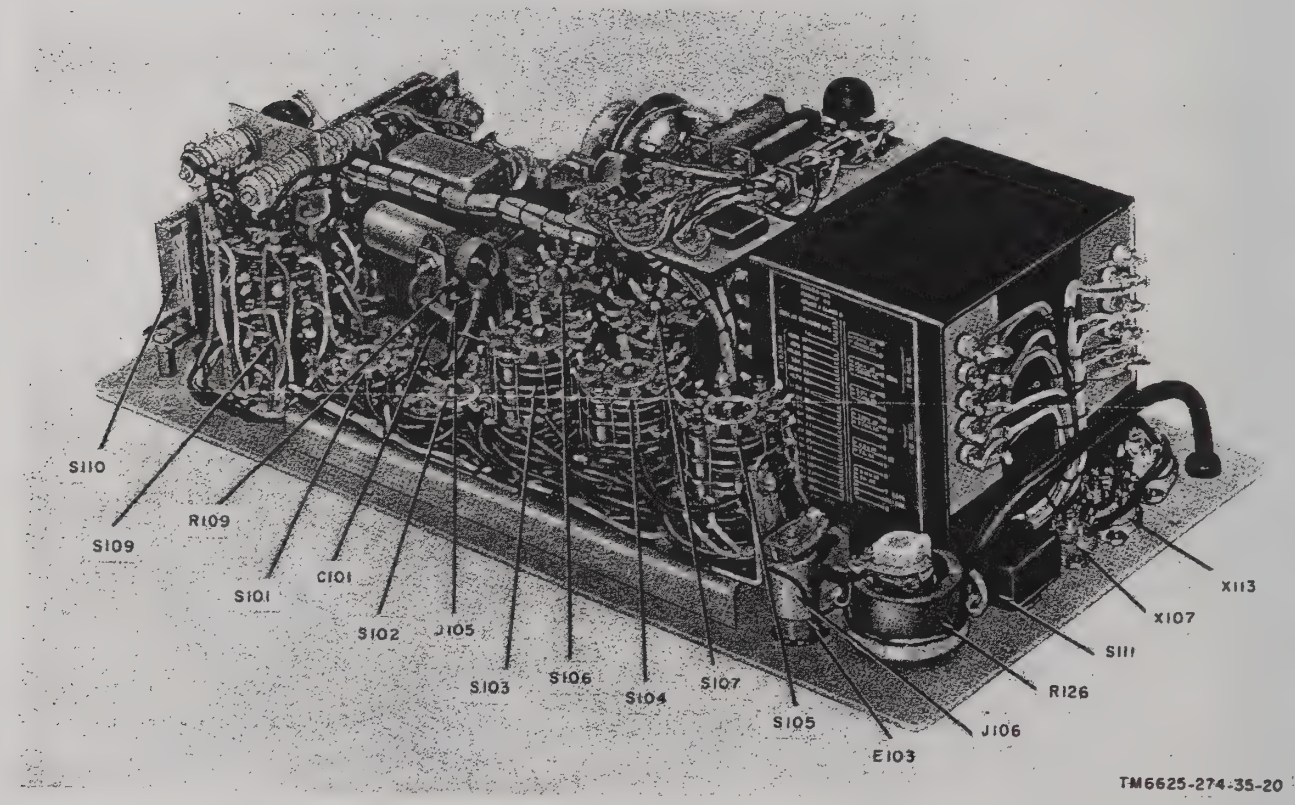


Figure 19. Test Set, Electron Tube TV–7/U, front-right oblique.

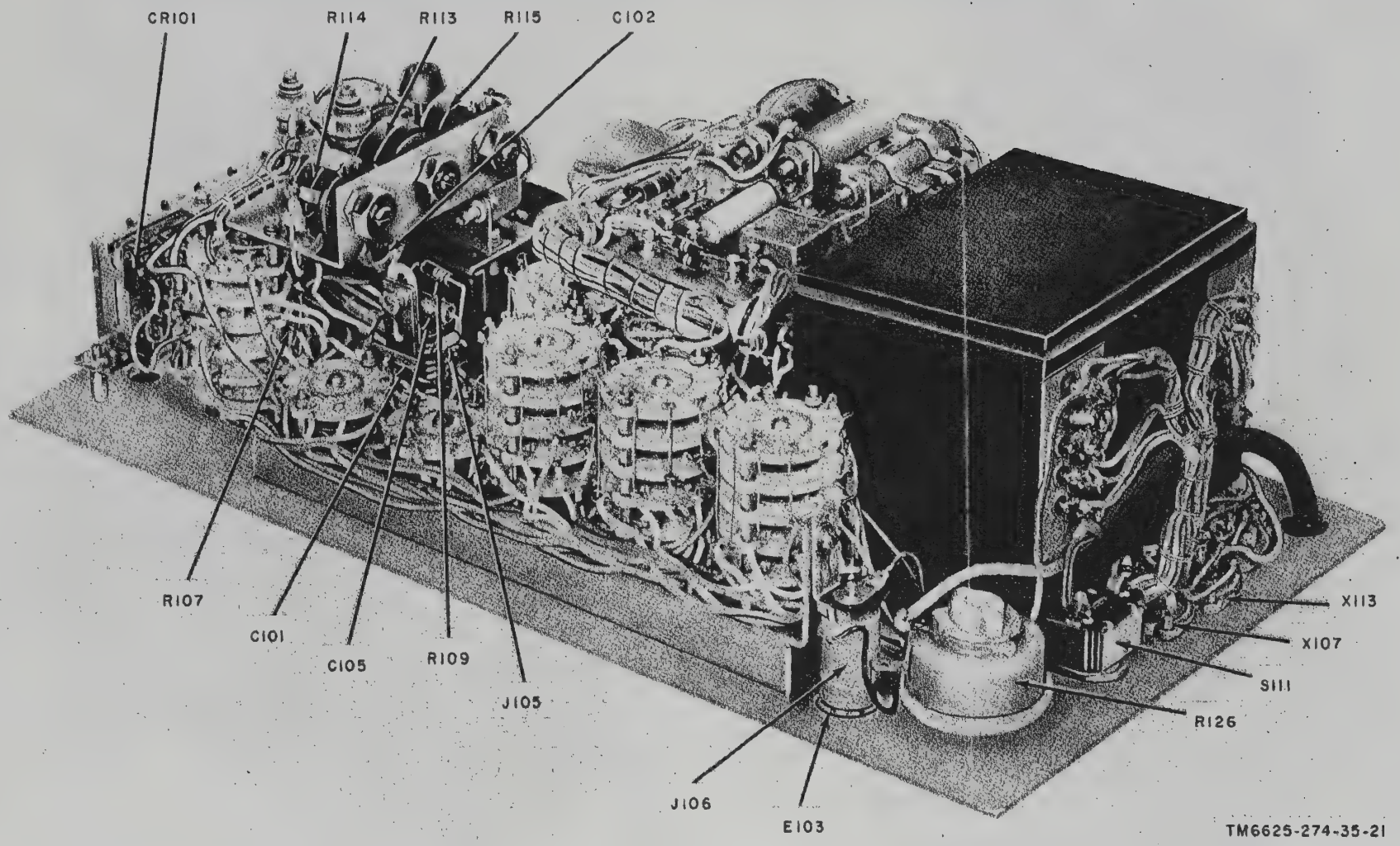


Figure 20. Test Set, Electron Tube TV–7A/U (serial numbers 1 through 1200), front-right oblique.

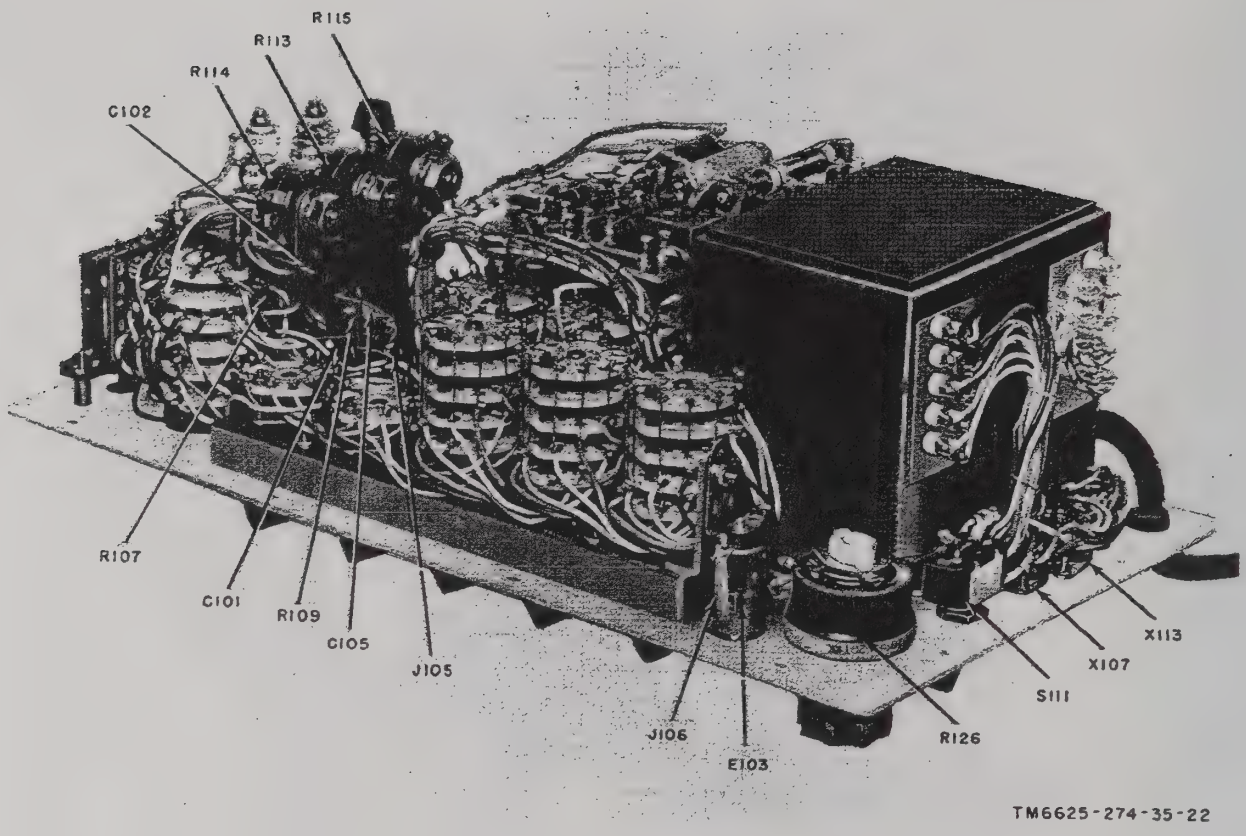


Figure 21. Test Set, Electron Tube TV–7A/U (serial numbers 1201 through 9492), front-right oblique.

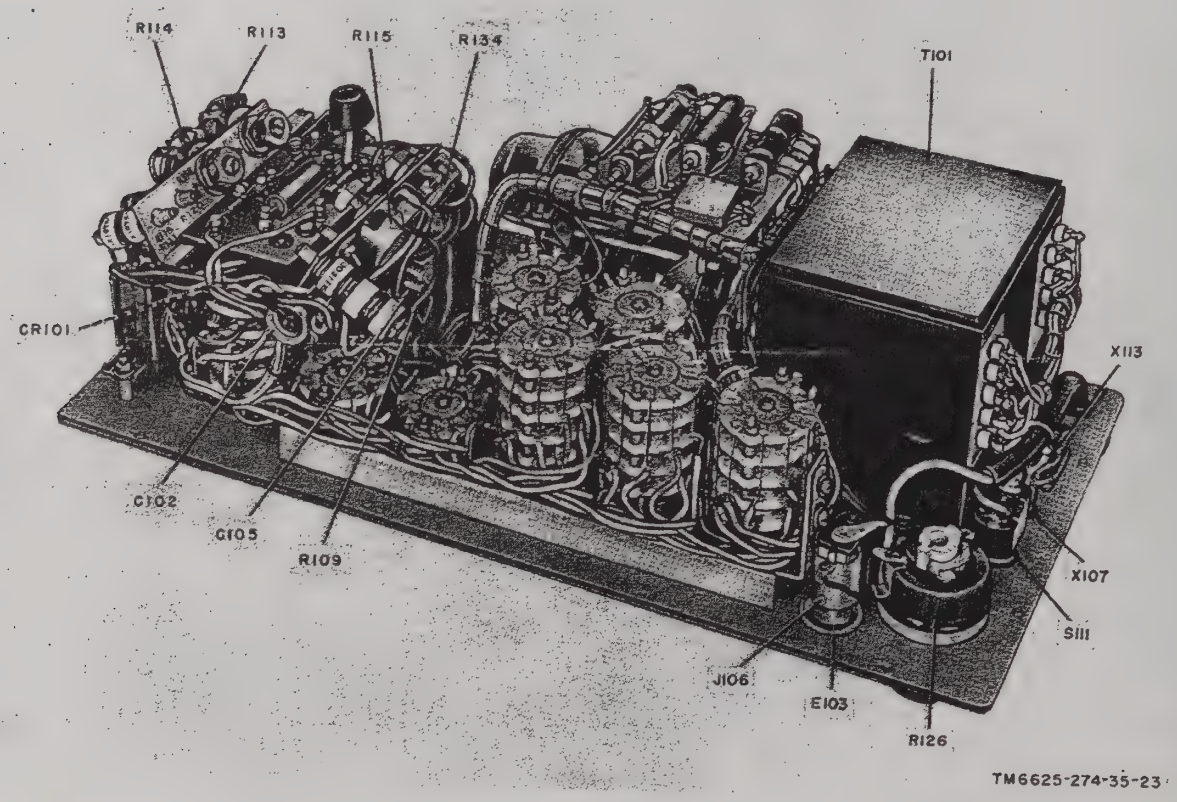


Figure 22. Test Set, Electron Tube TV–7B/U, front-right oblique.

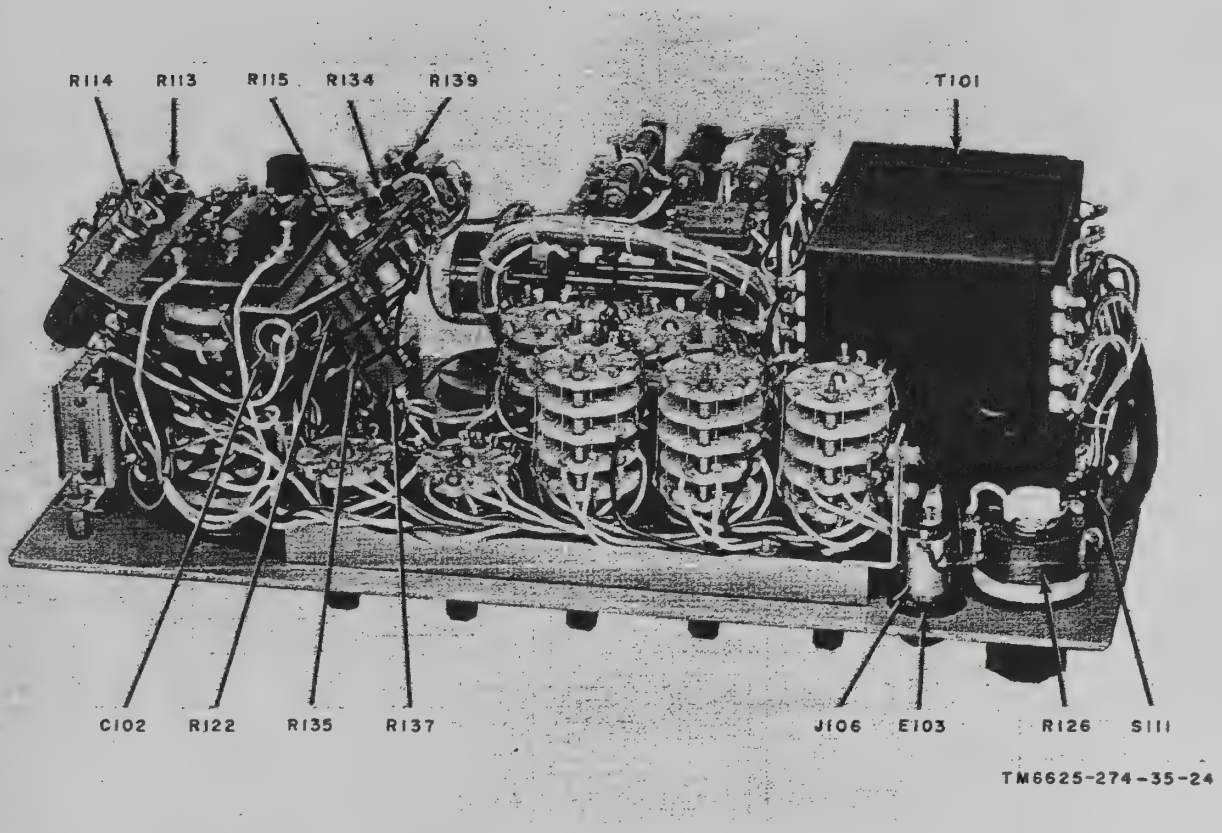


Figure 23. Test Set, Electron Tube TV–7D/U, front-right oblique.

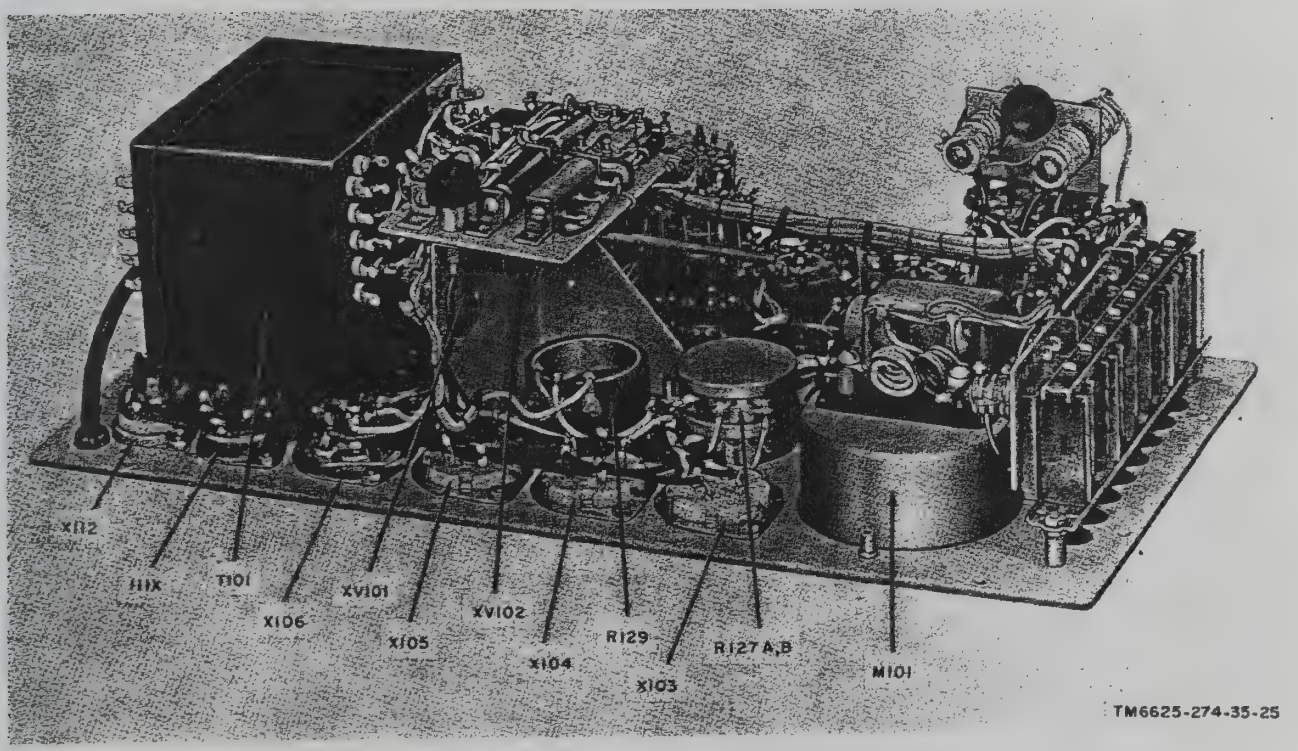


Figure 24. Test Set, Electron Tube TV–7/U, tubes removed, rear-right oblique.

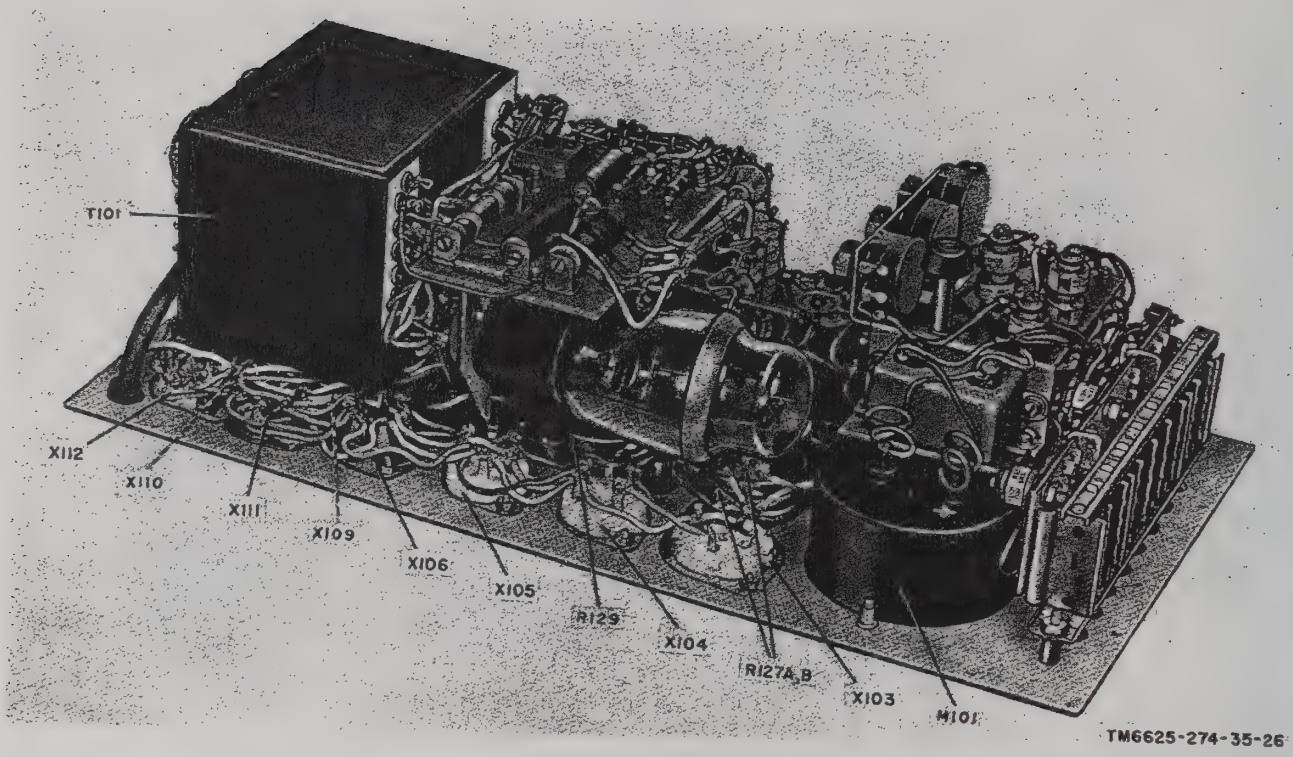


Figure 25. Test Set, Electron Tube TV–7A/U (serial numbers 1 through 1200), rear-right oblique.

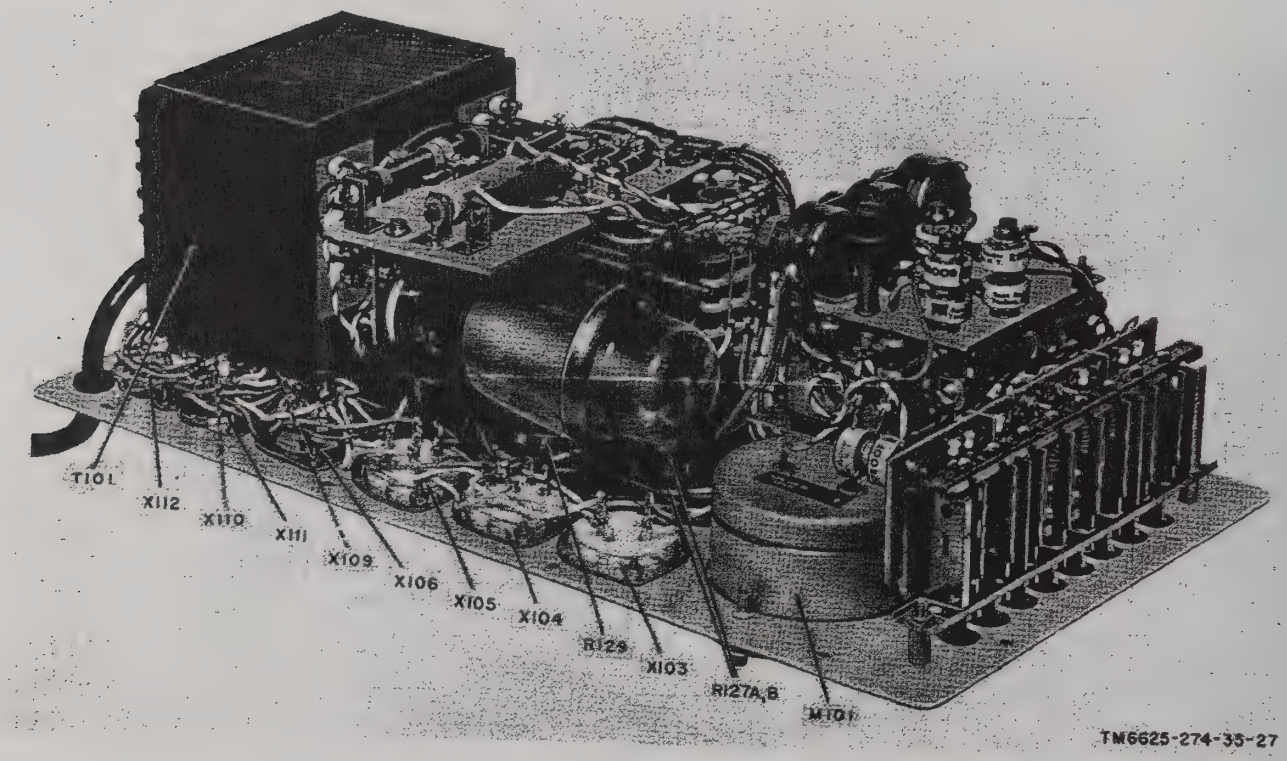


Figure 26. Test Set, Electron Tube TV–7A/U (serial numbers 1201 through 9492), rear-right oblique.

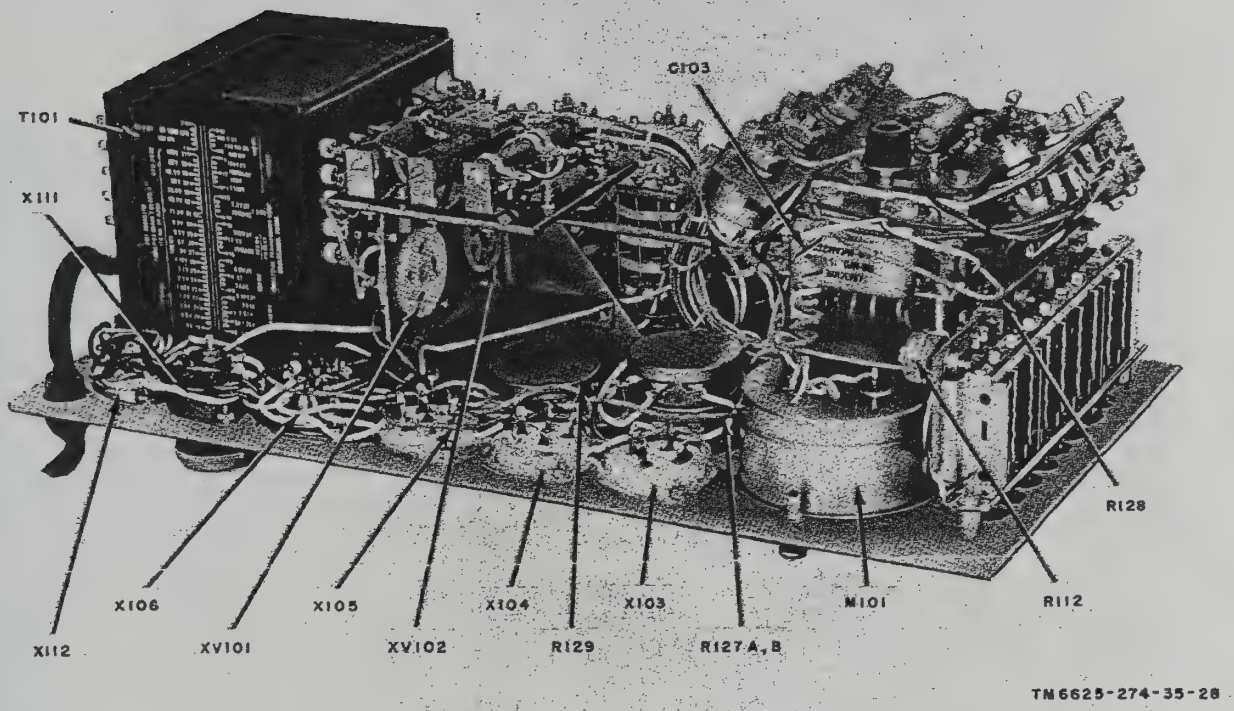


Figure 27. Test Set, Electron Tube TV–7D/U, tubes removed, rear-right oblique.

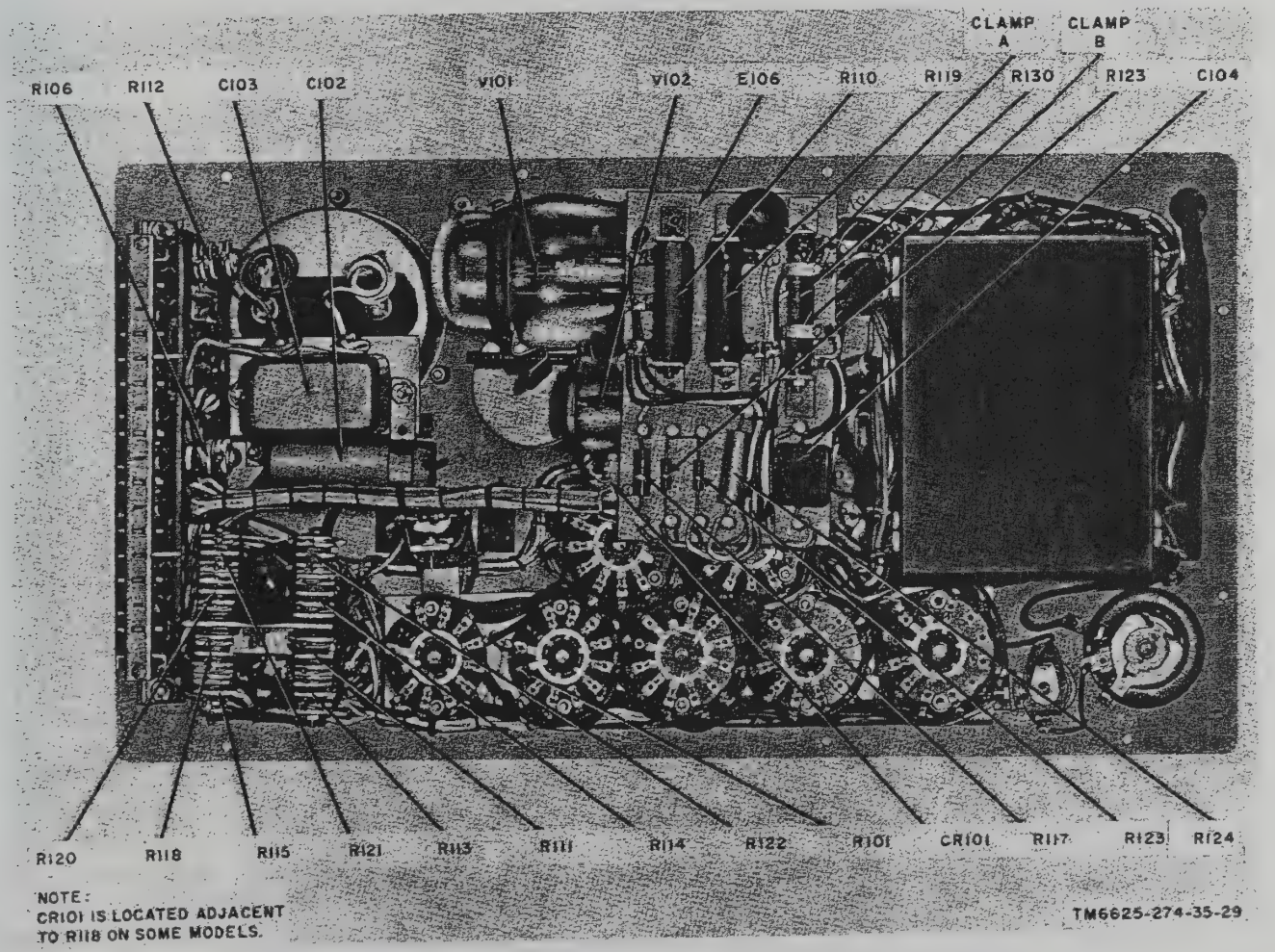


Figure 28. Test Set, Electron Tube TV–7/U, direct-rear view.

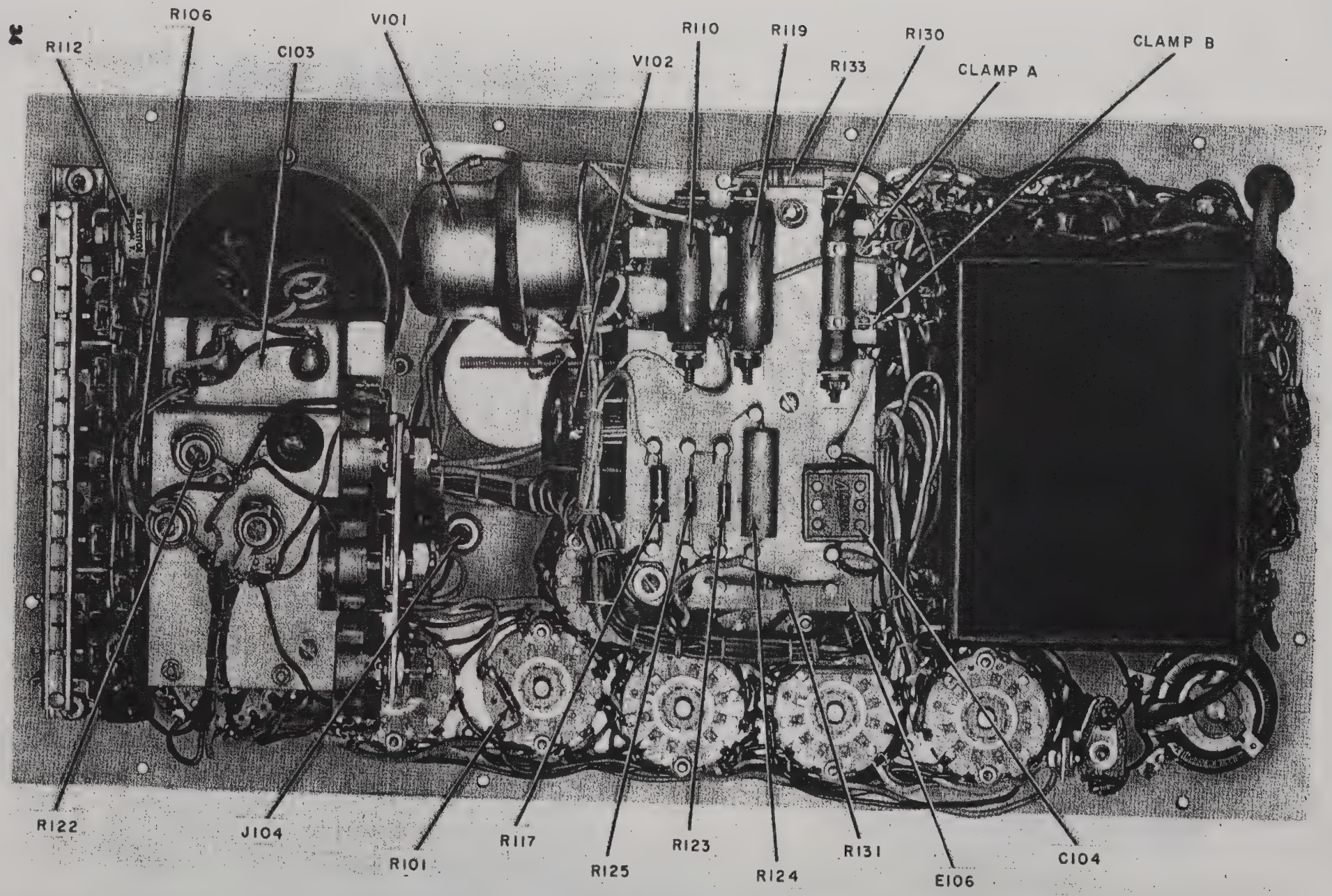


Figure 29. Test Set, Electron Tube TV–7A/U (serial numbers 1 through 1200), direct-rear view.

TM6625-274-35-30

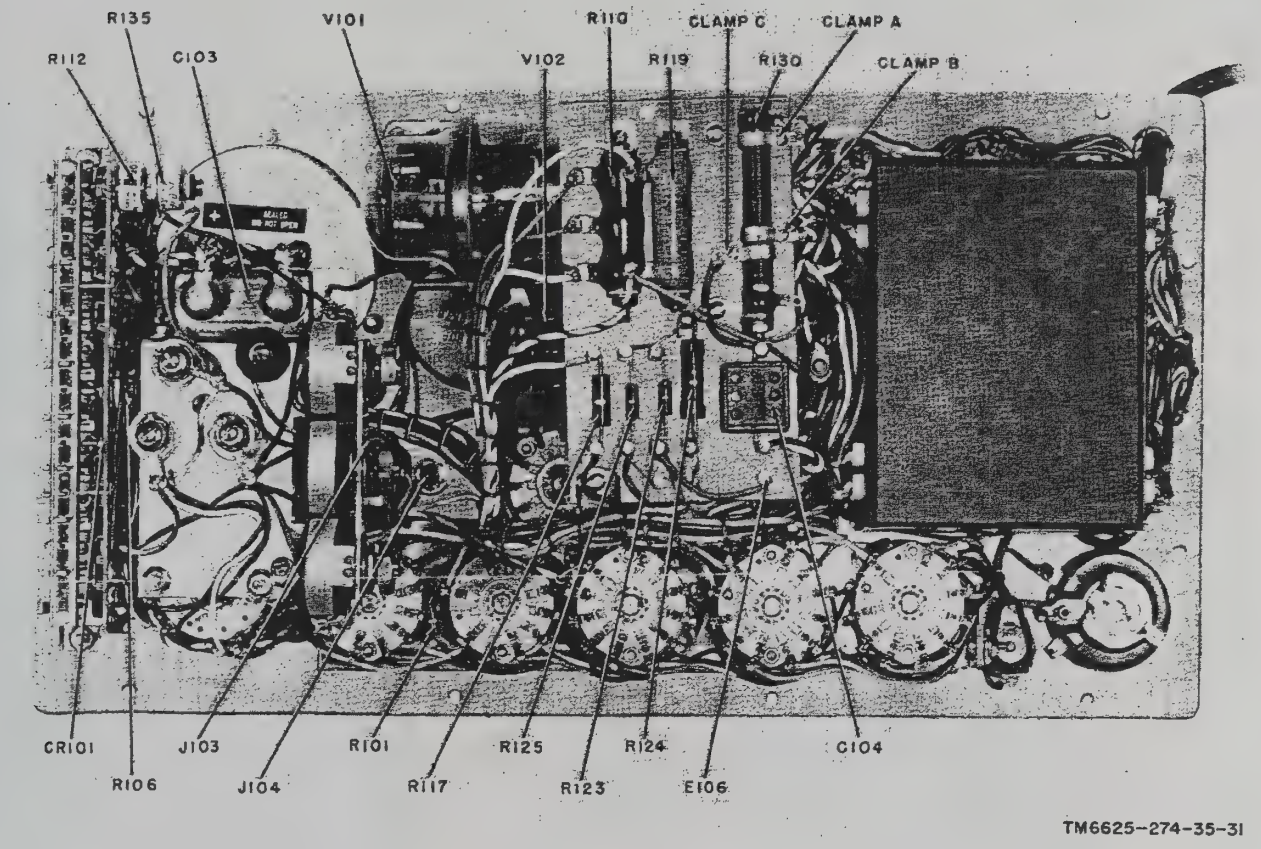


Figure 30. Test Set, Electron Tube TV–7A/U (serial numbers 1201 through 9492), direct-rear view.

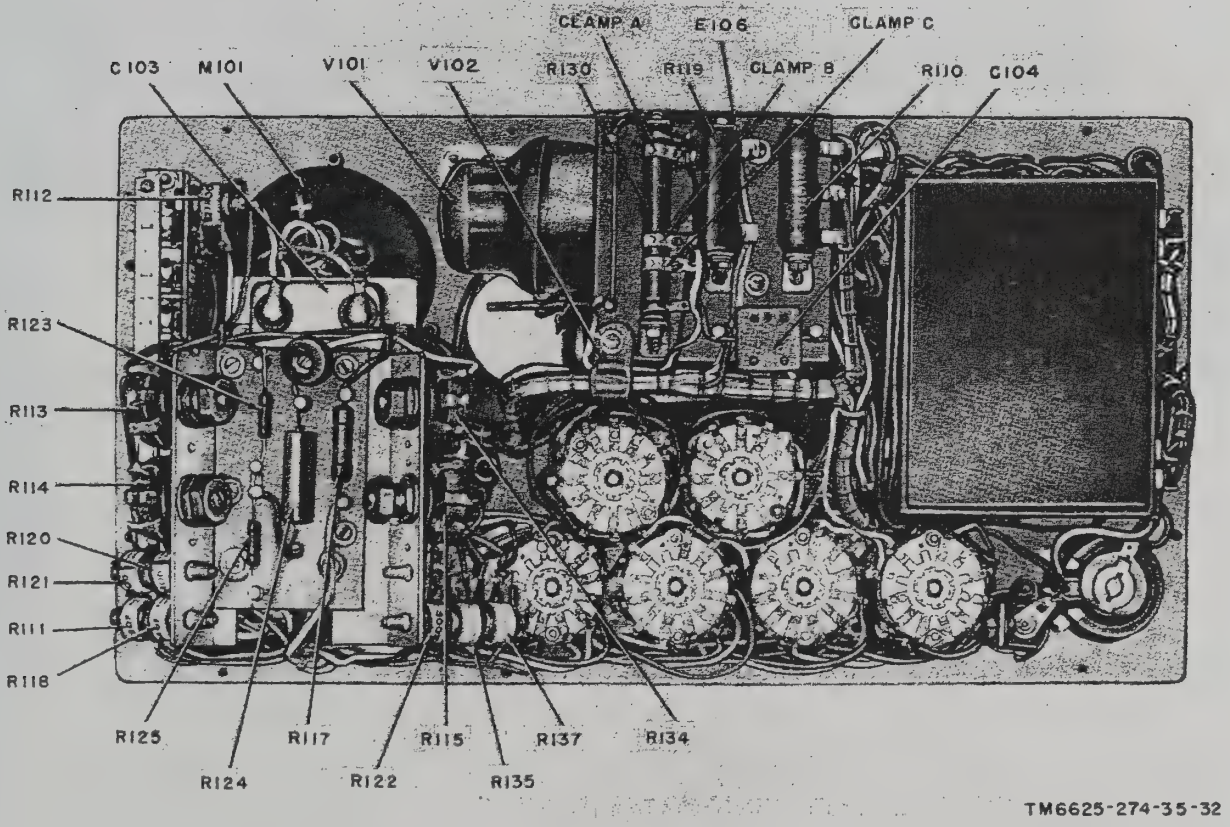


Figure 31. Test Set, Electron Tube TV–7B/U, direct-rear view.

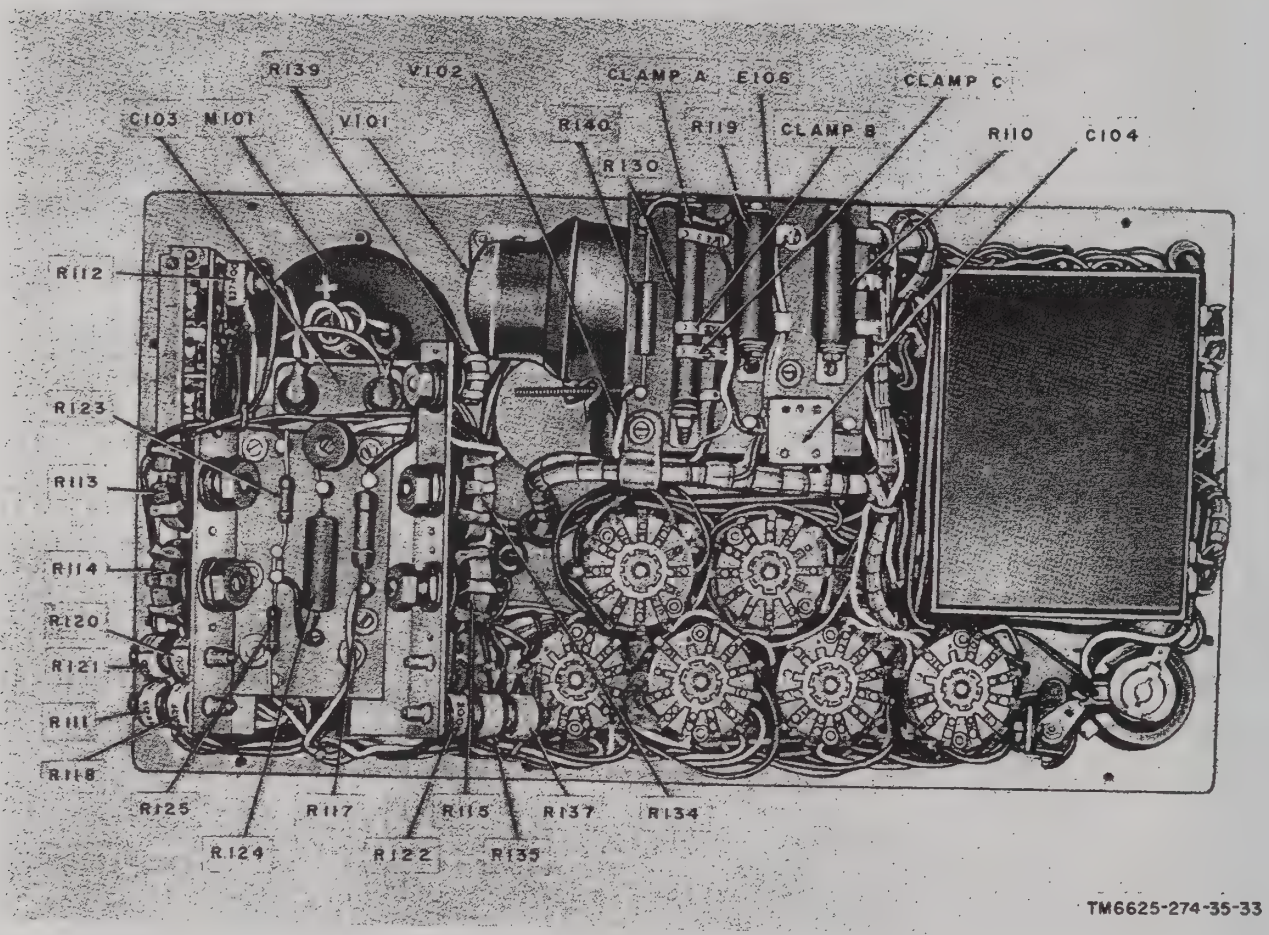
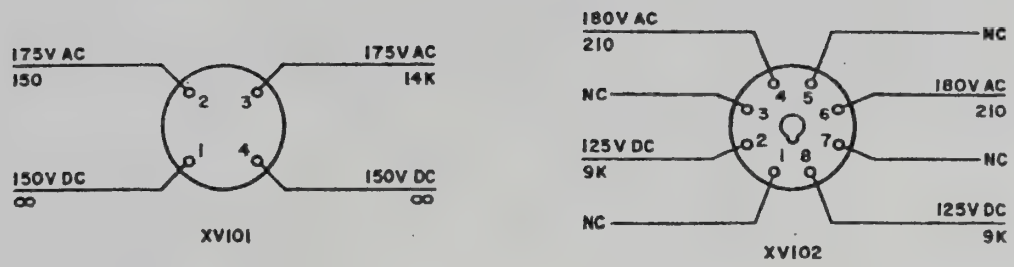


Figure 32. Test Set, Electron Tube TV–7D/U, direct-rear view.



NOTES:

1. VOLTAGES AND RESISTANCES MEASURED IN RESPECT TO TERMINAL 19 ON TRANSFORMER T101.
2. DC VOLTAGES MEASURED WITH A 1,000 OHMS-PER-VOLT METER.
3. NC INDICATES NO CONNECTION.
4. VOLTAGE READINGS ABOVE LINE, RESISTANCE READINGS BELOW LINE.
5. REFER TO TERMINAL BOARD VOLTAGE AND RESISTANCE DIAGRAM FOR SWITCH, SELECTOR, AND CONTROL SETTINGS.
6. DEPRESS [LINE ADJ.] PUSH BUTTON AND ROTATE [LINE] [ADJUST] CONTROL UNTIL METER POINTER IS DIRECTLY OVER [LINE TEST] MARK.

TM6625-274-35-35

Figure 34. Tube socket voltage and resistance diagram.

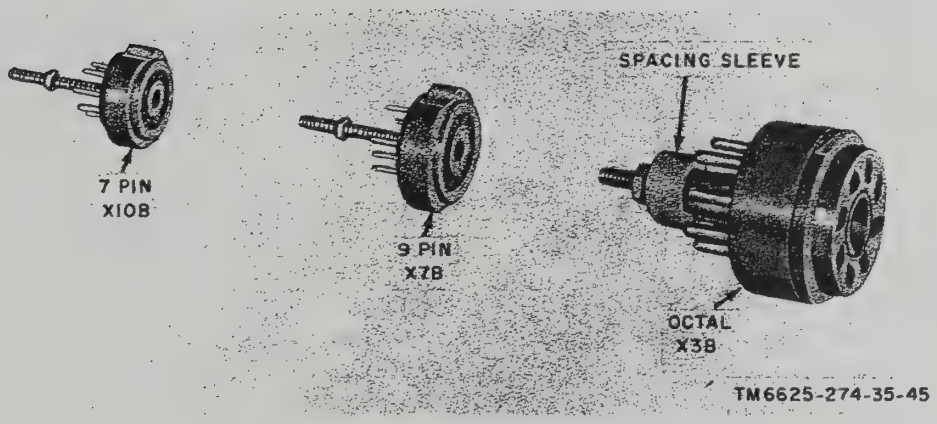


Figure 35. Socket-saver adapters (TV-7D/U).

17. Dc Resistances of Transformer T101

The dc resistances of the transformer windings are listed below. Measure the resistances with the tubes removed.

Terminals	Resistance (ohms)
1–2	10.5
3–5	Less than 1
6–8	Less than 1
9–10	80
11–12	70
11–13	78
14–15	3
16–17	150
16–18	300
19–31	Less than 1
19–32	2.5
19–33	4
19–34	7
19–35	10.5
19–36	16
19–37	26

18. Replacement of Socket-Saver Adapters (TV–7D/U)

Replace socket-saver adapter X3B, X7B, or X10B (fig. 35) as follows:

a. Removal.

(1) Remove the test set chassis (TM 11-6625-274-12) from the case.

(2) Remove the hexagonal nut from the threaded stud of the adapter to be replaced. Also, remove the spacing sleeve when replacing adapter X10B.

(3) Remove the adapter from the test socket.

b. Replacement.

(1) Plug the adapter into its corresponding test socket. Be sure to place the spacing sleeve over the threaded stud of adapter X10B.

(2) Replace and tighten the hexagonal nut.

(3) Replace the test set chassis (TM 11-6625-274-12) in the case.

CHAPTER 3
TESTS, ADJUSTMENTS, AND CALIBRATION PROCEDURES

Section I. TESTS AND ADJUSTMENTS

19. General

All components of the test set are mounted on the rear of the front panel. Components can be adjusted or replaced without the use of special tools. The following precautions apply specifically to this equipment:

a. Tag each lead after removing it from a component. Be careful not to damage other leads by pushing or pulling them out of the way.

b. Do not allow drops of solder to fall into the test set.

c. Do *not* disturb the adjustable contacts on R130 or the settings of variable resistors unless readjustment is indicated as a result of voltage or circuit tests (para 22–26) or replacement of the part is indicated by the trouble-shooting chart (para 16*c*).

20. Test Equipment and Parts Required for Tests

The following charts list the test equipment and parts required to test the TV–7(*)/U, the associated technical manuals, and the assigned common names.

a. Test Equipment.

Test equipment	Technical manual	Common name
Multimeter TS–352/U	TM 11–5527	Multimeter
Resistor, Decade ZM–16/U	TM 11–5102	Decade resistor
Voltmeter, Meter ME–30A/U	TM 11–5132	Voltmeter

b. Parts.

Part	Federal stock No.
Transformer, Variable CN–16/U	5950–235–2086
Transformer (isolation)	5950–498–2146
Resistor, 10,000 ohms	5905–117–4194
Resistor, 12,000 ohms (2 each)	5905–107–5148
Resistor, 100,000 ohms	5905–120–0894
Resistor, 375,000 ohms	5905–202–0030
Resistor, 510,000 ohms	5905–279–2516

21. Test Requirements

Observe the following requirements when checking voltages (para 22–26) in the test set:

a. Set the LINE ADJUST control so that the test set meter indicates LINE TEST when pushbutton 1 — LINE ADJ. is depressed, unless otherwise specified.

b. Set the selectors and the controls to HS5–3460, BIAS to 0, and SHUNT to 0, unless otherwise specified.

c. Set the POWER switch to ON at least 20 minutes before tests are made, except for the short circuit tests (para 25).

22. Bias Voltage Test

a. Connect the multimeter from the cathode to the control grid (pin 6 to pin 5) of the OCTAL test socket and adjust the BIAS control to 22. The multimeter should indicate 3 volts, ±0.2 volt.

b. Perform the following procedure if the voltage indicated by the multimeter is incorrect:

(1) Adjust clamp A on R130 (TV–7/U or TV–7A/U (serial numbers 1 through 1200)) until the correct voltage is obtained.

(2) Adjust clamp C on R130 (TV–7A/U (serial numbers 1201 through 9492), TV–7B/U, or TV–7D/U) until the correct voltage is obtained.

c. Make the following bias voltage checks after the multimeter indicates 3 volts, ±0.2 volt for a BIAS control setting of 22:

BIAS control setting	TV–7/U	TV–7A/U	TV–7B/U	TV–7D/U
50	13.4 volts, ±1.	13.7 volts, ±1.	13.4 volts, ±1.	13.4 volts, ±1.
75	25 volts, ±1.4.	26.3 volts, ±1.4.	25.8 volts, ±1.	25.8 volts, ±1.
100	40 volts, ±2.	40 volts, ±2.	40 volts, ±2.	40 volts, ±2.[a]

[a] On the TV–7D/U, adjust R139 (fig. 23) until the voltmeter indicates a bias of 4 volts ±1 for RANGES F of the FUNCTION SWITCH.

d. Readjust the clamp (*b* above) until the bias voltages are within the limits specified (*c* above) for the various BIAS control settings.

23. Plate Voltage and Line Adjust Circuit Test

a. Connect a 375,000-ohm resistor (para 20*b*) in parallel with the multimeter from the cathode to the plate (pin 6 to pin 3) of the OCTAL test socket.

b. Depress pushbutton 3 — MUT. COND. and vary the LINE ADJUST control so that the multimeter indicates 150 volts ±3. The test set meter should indicate LINE TEST.

c. Perform the following procedure when the test set meter indicates below LINE TEST (TV-7/U or TV-7A/U):

(1) Connect the decade resistor parallel to R124.

(2) Adjust the decade resistor so that the test set meter indicates LINE TEST.

Note. The resistance should be between 2 and 15 megohms for the TV-7/U and between 1.5 and 20 megohms for the TV-7A/U.

(3) Solder a resistor of the correct value parallel to R124.

d. Perform the following procedure when the test set meter indicates above LINE TEST (TV-7/U or TV-7A/U):

(1) Connect the decade resistor in parallel with CR101.

(2) Adjust the decade resistor so that the test set meter indicates LINE TEST.

Note. The resistance should be between 40,000 and 50,000 ohms for the TV-7/U and between 10,000 and 100,000 ohms for the TV-7A/U.

(3) Solder a resistor of the correct value parallel to CR101.

e. Adjust R134 (TV-7B/U or TV-7D/U).

(1) Determine and mark the midposition of R134.

(2) Adjust R134 until the test set meter indicates LINE TEST. If the setting of R134 is approximately 45° to either side of the midposition ((1) above), check CR101 and R134.

24. Screen Grid Voltage Test

a. Connect a 375,000-ohm resistor (para 20*b*) in parallel with the multimeter from the cathode to the screen grid (pin 6 to pin 4) of the OCTAL test socket.

b. Depress pushbutton 3 — MUT. COND. and vary the LINE ADJUST control so that the multimeter indicates 130 volts ±3. The test set meter should indicate LINE TEST.

c. If the multimeter does not indicate 130 volts ±3 (TV-7A/U (serial numbers 1201 through 9492), TV-7B/U, or TV-7D/U), adjust clamp A on R130 (fig. 30-32) until the correct voltage is obtained.

d. Depress both the 3 — MUT. COND. and 2 — DIODE pushbuttons. The multimeter should indicate 56 volts ±1.5.

e. If the multimeter does not indicate 56 volts ±1.5 (TV-7(*)/U), adjust clamp B on R130 until the correct voltage is obtained.

f. When the difference between the plate voltage and the high (130 volts ±3) screen grid voltage is greater than 30 volts or less than 10 volts, check both rectifier tubes. Be sure that all component defects have been eliminated. If the difference between voltages is still too great or too small, proceed as follows:

(1) Reverse the filament-cathode leads at the type 83 rectifier tube socket (pins 1 and 4), and recheck the plate (para 23*b*) and screen grid (*b* above) voltages.

(2) If the voltage difference increased again or stayed the same, return the leads ((1) above) to their original position and reverse the filament-cathode leads of the type 5Y3WGTA rectifier tube (para 2*b*) at terminals 3 and 5 of T101.

(3) Recheck the plate (para 23*b*) and screen grid (*b* above) voltages. If the voltage difference increased or stayed the same, return the leads ((2 above) to their original position.

(4) Replace the bias potentiometer (R129) with one of a lower value. A reduction of approximately 100 ohms will reduce the high screen grid voltage approximately 1 volt.

Note. If R129 is changed, recheck the plate (para 23*b*) and screen grid (*b* above) voltages.

25. Short Circuit Tests

a. Set the selectors and the controls to HS5-3468, BIAS to 0, and SHUNT to 0.

b. Connect a 100,000-ohm resistor (para 20*b*) between the pins of the OCTAL test socket as indicated in the chart (*c* below), and rotate the FUNCTION SWITCH to positions 1 through 5.

c. The SHORTS lamp should glow in the positions marked "X" when the resistor (*b* above) is connected between the indicated pins on the OCTAL test socket.

Resistor connections	FUNCTION SWITCH position				
	1	2	3	4	5
Screen to suppressor (pin 4 to pin 8)	X	X	X	X	X
Screen to control grid (pin 4 to pin 5)		X	X	X	
Screen to plate (pin 4 to pin 3)		X	X		
Control grid to cathode (pin 5 to pin 6)	X	X	X		X
Control grid to suppressor (pin 5 to pin 8)	X				X
Control grid to plate (pin 5 to pin 3)				X	
Plate to suppressor (pin 3 to pin 8)	X			X	X
Filament to plate (pin 2 to pin 3)	X	X		X	X
Filament to control grid (pin 2 to pin 5)	X	X			X
Filament to screen (pin 2 to pin 4)	X		X	X	X
Filament to suppressor (pin 2 to pin 8)		X			
Filament to cathode (pin 2 to pin 6)			X		

d. Connect a 510,000-ohm resistor (para 20*b*) between the pins of the OCTAL test socket as indicated in the chart (*c* above), and rotate the FUNCTION SWITCH to positions 1 through 5. The SHORTS lamp should not glow in any combination of FUNCTION SWITCH position or resistor connection.

26. Simulated Tube Test

a. Set the FUNCTION SWITCH to RANGES B and connect the equipment as shown in figure 36.

b. Adjust the variable transformer (para 20*b*) so that the voltmeter indicates 50 volts.

c. Depress pushbutton 3 — MUT. COND. The test set meter should indicate 40 scale divisions $\pm\frac{1}{2}$.

Note. If the meter pointer deflects to the left, reverse the power cord plug of the variable transformer.

d. If the test set meter (TV-7/U only) does not indicate 40 scale divisions $\pm\frac{1}{2}$, connect the decade resistor in parallel with R113.

(1) Adjust the decade resistor so that the test set meter indicates 40 scale divisions $\pm\frac{1}{2}$.

(2) Solder a resistor of the correct value in parallel with R113.

e. When the test set meter (except for the TV-7/U) indicates more than 40.5 divisions, adjust R113 until the correct indication is obtained.

f. When the test set meter (except for the TV-7/U) indicates less than 39.5 divisions,

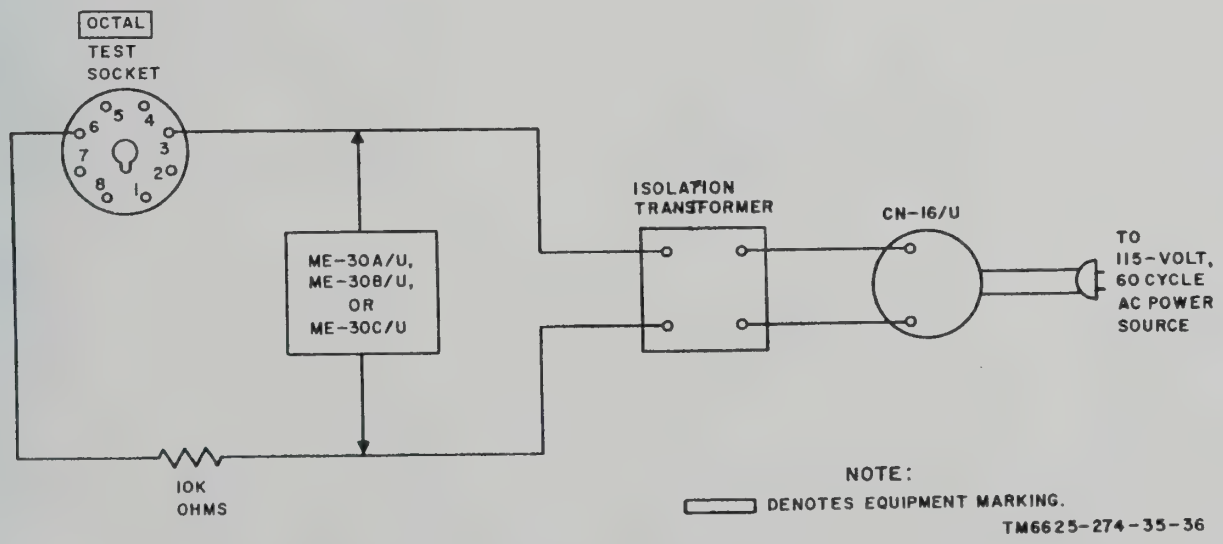


Figure 36. Connection for simulated tube test.

adjust R115 until the correct indication is obtained.

g. FUNCTION SWITCH settings and meter indications with pushbutton 3 — MUT. COND. depressed should be as follows:

(1) With the FUNCTION SWITCH in position B, D, E, or F, the test set meter should indicate 40 scale divisions $\pm\frac{1}{2}$.

(2) With the FUNCTION SWITCH in position C, the test set meter should indicate 20 scale divisions $\pm\frac{1}{2}$.

Section II. CALIBRATION PROCEDURES

27. Shunt Control

Perform the following calibration procedure if SHUNT control R127 is out of adjustment or is replaced.

a. Set the FUNCTION SWITCH to A.

b. Depress pushbutton 1 — LINE ADJ. and vary the LINE ADJUST control until the meter pointer indicates LINE TEST.

c. Set the SHUNT control to 90.

d. Connect two 12,000-ohm resistors (para 20*b*) in parallel between the cathode and the plate (pin 6 to pin 3) of the OCTAL test socket.

e. Depress and hold pushbutton 3 — MUT. COND. The test set meter pointer should indicate 0 divisions ± 2.

f. Turn the movable cap on the lower half of R127 (fig. 24-27) until the correct meter indication (*e* above) is obtained.

g. Release pushbutton 3 — MUT. COND. and solder the movable cap to the casing of R127.

h. Recheck for the correct meter indication (*e* above).

28. Range C of Function Switch

a. Set the selectors and the controls to HS5-3481, BIAS 100, and FILAMENT VOLTAGE 6.3. Set the FUNCTION SWITCH to RANGES B.

b. Insert a 6L6 electron tube in the OCTAL test socket. Allow the tube to warm up for at least 5 minutes.

c. Depress pushbutton 1 — LINE ADJ. and vary the LINE ADJUST control until the meter pointer indicates LINE TEST.

d. Depress pushbutton 3 — MUT. COND. and adjust the BIAS control until the meter pointer indicates 120.

e. Set the FUNCTION SWITCH to RANGES C.

f. Depress pushbutton 3 — MUT. COND. The meter pointer should indicate 60 scale divisions $\pm\frac{1}{2}$.

(1) If the test set meter (TV-7/U only) does not indicate 60 scale divisions $\pm\frac{1}{2}$, connect the decade resistor in parallel with R114.

(a) Adjust the decade resistor so that the test set meter indicates 60 scale divisions $\pm\frac{1}{2}$.

(b) Solder a resistor of the correct value in parallel with R114.

(2) If the test set meter (except for the TV-7/U) does not indicate 60 scale divisions $\pm\frac{1}{2}$, adjust R114 until the correct indication is obtained.

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CHAPTER 4
FOURTH ECHELON TESTING PROCEDURES AND FINAL TESTING

Section I. FOURTH ECHELON TESTING PROCEDURES

29. General

a. Testing procedures are prepared for use by Signal Field Maintenance Shops and Signal Service Organizations responsible for fourth echelon maintenance of signal equipment to determine the acceptability of repaired equipment. These procedures set forth specific requirements that repaired signal equipment *must* meet before it is returned to the using organization. The testing procedures may also be used as a guide for testing equipment repaired at third echelon if the proper tools and test equipment are available. A summary of the performance standard is given in paragraph 38.

b. Each test depends on the preceding one for certain operating procedures and, where applicable, for test equipment calibrations. Comply with the instructions preceding the body of each chart before proceeding to the chart. Perform each test in sequence. Do not vary the sequence. For each step, perform all the actions required in the *Test equipment, control settings* and *Equipment under test, control settings* columns; then perform each specific test procedure and verify it against its performance standard.

30. Test Equipment and Materials Required

All test equipment, materials, and other equipment required to perform the testing procedures given in this section are listed in the following chart and are authorized under TA 11-17 and TA 11-100(11-17), or are repair part items of the subject equipment authorized for stockage at fourth echelon level.

Nomenclature	Federal stock No.	Reference
Multimeter TS-352(*)/U[ab]	6625-242-5023	TM 11-5527
Voltmeter, Meter ME-30A/U or Voltmeters, Electronic ME-30B/U or ME-30C/U	6625-669-0742	TM 11-5132
Light Assembly, Electric MX-1292/PAQ	6695-537-4470	TM 11-5540
Tube Socket Adapter MX-1258/U	5935-378-5009	NAVSHIPS 91798
Transformer, Variable CN-16/U	5950-235-2086	None
Resistor, 10,000 ohms	5905-199-1600	None

[a] Indicates model TS-352/U, TS-352A/U, or TS-352B/U.
[b] Multimeter AN/URM-105 may be used in place of Multimeter TS-352(*)/U.

31. Test Facilities

No special test facilities are required to perform the tests given in this procedure. All tests should be performed using 115- to 120-volt, 60-cycle, ac power. All connecting cords are a part of the test equipment or the equipment under test unless otherwise indicated on the applicable illustration.

32. Modification Work Orders

The performance standards listed in the tests (para 34 through 37) assume that the modification work order listed below has been performed. A listing of current modification work orders will be found in DA Pamphlet 310-4.

MWO No.	Date	Priority	Echelon	Location of MWO marking	Remarks
MWO 6625-274-35/1	24 Jun 59	N	3	Adjacent to nameplate	All sets

33. Moistureproofing and Fungiproofing

All areas, parts, and connections disturbed by repair and/or testing must be checked for proper moistureproofing and fungiproofing.

34. Physical Tests and Inspection

a. Test Equipment and Materials. Light Assembly, Electric MX–1292/PAQ.

b. Test Connections and Conditions. All tests should be made after repair has been completed, but before the equipment has been replaced in its case.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Procedure	Performance standard
1	N/A	Controls may be in any position.	*a.* Inspect case (inside and outside) and control panel for signs of physical damage, missing parts, and condition of paint. *Note.* Touchup painting is recommended instead of refinishing. Screwheads, binding posts, receptacles, and plated fasteners will not be painted or polished with abrasives.	*a.* No damage or missing parts should be evident. External surfaces intended to be painted do not show bare metal. Panel lettering is legible.
			b. Operate each control and switch throughout its entire range, checking for proper mechanical operation. Check for loose or missing knobs.	*b.* Each control operates smoothly, without binding, throughout its entire range. All knobs are in place, tight, and properly indexed.
			c. Inspect all jacks, tube sockets, connectors, and power cord and plug.	*c.* All jacks, tube sockets, and connectors are in good condition, and show no signs of damage or excessive wear.
2	MX–1292/PAQ: Connect mercury-vapor lamp. Install wide transmission filter.	N/A	Turn on mercury-vapor lamp (switch labeled 245V) and expose that portion of the equipment that has been repaired or disturbed, to the direct rays of the lamp.	All parts, wires, and chassis surfaces show continuous coverage. *Note.* MFP varnish glows gray-green under the mercury-vapor lamp.

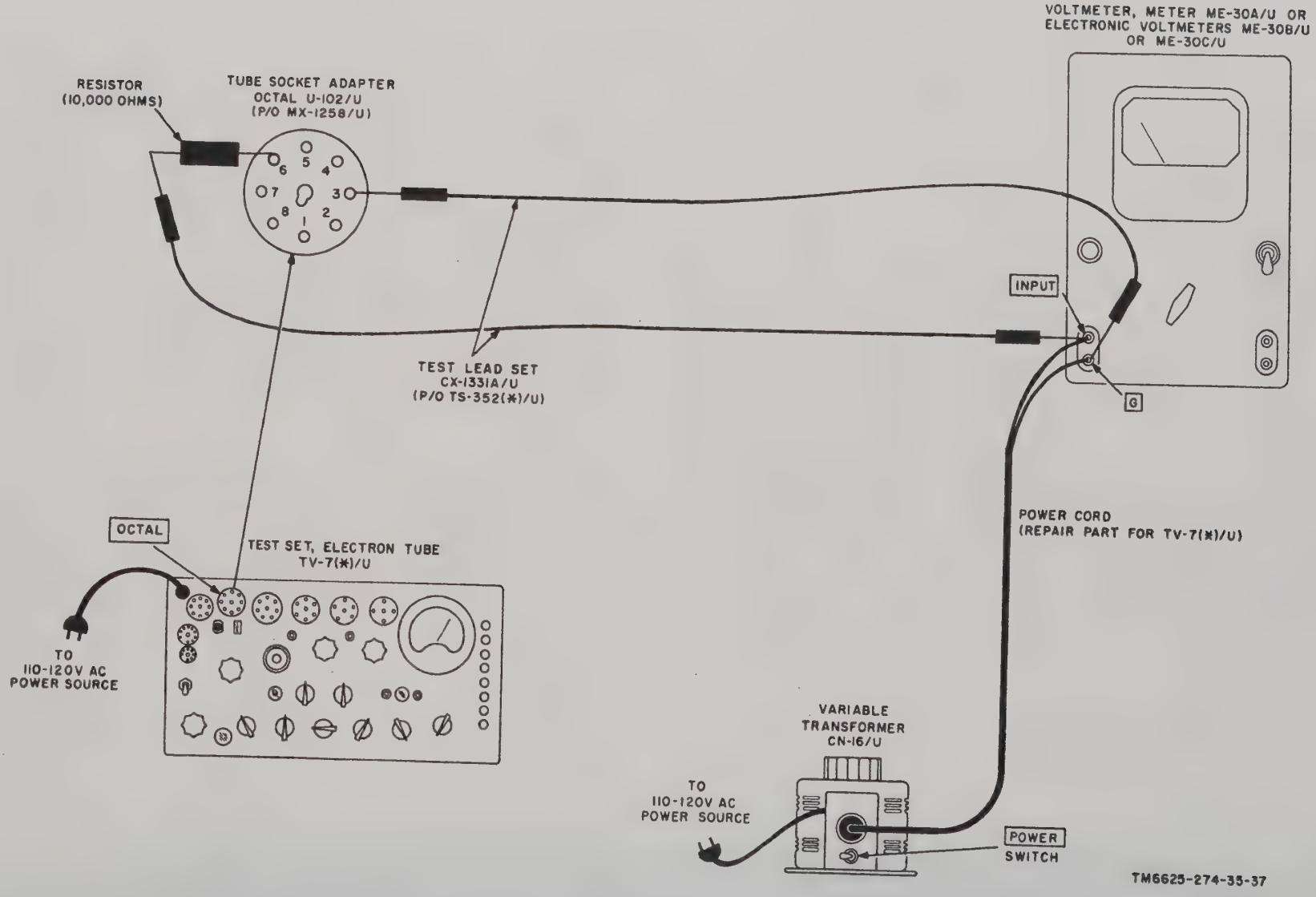

Figure 37. Calibration test.

35. Calibration Test
(fig. 37)

a. Test Equipment and Material.

(1) Voltmeter, Meter ME-30A/U or Electronic Voltmeter ME-30B/U or ME-30C/U.

(2) Transformer, Variable CN-16/U.

(3) Test Lead Set CX-1331A/U (p/o TS-352(*)/U).

b. Test Connections and Conditions. Connect the equipment as shown in figure 37.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Procedure	Performance standard
1	ME-30A/U, ME-30B/U, or ME-30C/U: Range: 100 V CN-16/U: POWER: ON Selector dial: maximum counterclockwise. POWER: ON *Note.* Adjust CN-16/U for exactly 50-volt indication on ME-30A/U, ME-30B/U, or ME-30C/U.	POWER: ON FUNCTION SWITCH: B BIAS: 0 SHUNT: 0 Selector switches: FILAMENT: Left: H Right: S GRID: 5 PLATE: 3 SCREEN: 4 CATHODE: 6 SUPPRESSOR: 0	*a.* Depress pushbutton 3 — MUT. COND. and note indication on meter of TV-7(*)/U. *Note.* If the meter needle deflects to the left, reverse the power plug at the power source.	*a.* Meter should indicate 40 scale divisions ± ½.
			b. Set FUNCTION SWITCH to C, depress pushbutton 3 — MUT. COND., and note indication on meter of TV-7(*)/U.	*b.* Meter should indicate 20 scale divisions ± ½.
			c. Set FUNCTION SWITCH to D, depress pushbutton 3 — MUT. COND., and note indication on meter of TV-7(*)/U.	*c.* Meter should indicate 40 scale divisions ± ½.
			d. Set FUNCTION SWITCH to E, depress pushbutton 3 — MUT. COND., and note indication on meter of TV-7(*)/U.	*d.* Meter should indicate 40 scale divisions ± ½.
			e. **TV-7D/U only:** Set FUNCTION SWITCH to F, depress pushbutton 3 — MUT. COND., and note indication on meter of TV-7D/U.	*e.* Meter should indicate 40 scale divisions ± ½.

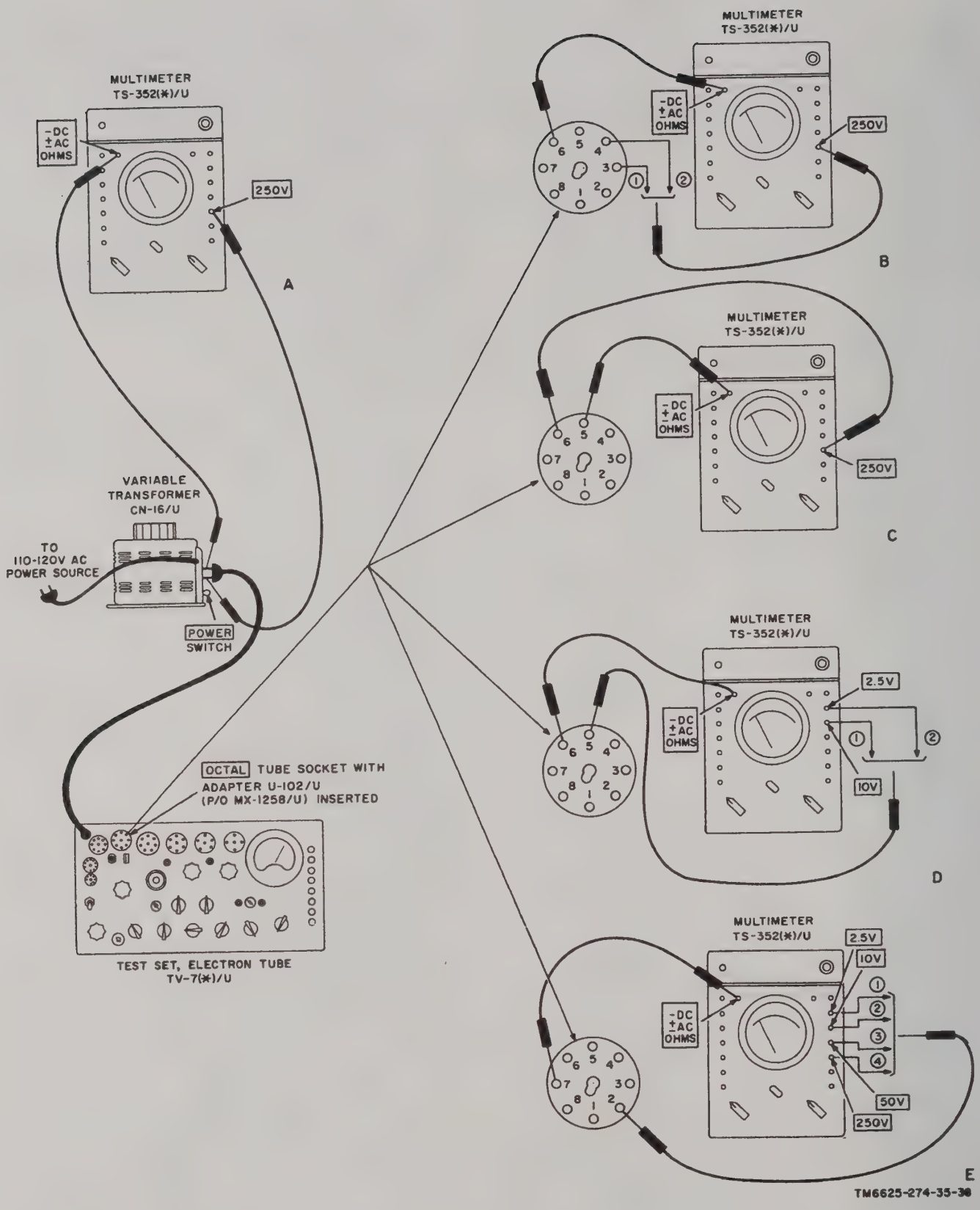

Figure 38. Voltage tests.

36. Voltage Tests

(fig. 38)

a. Test Equipment and Material.

(1) Tube Socket Adapter MX-1258/U.

(2) Multimeter TS-352(*)/U.

(3) Transformer, Variable CN-16/U.

b. Test Connections and Conditions. Connect the equipment as shown in A, figure 38.

c. Procedure.

Step No.	Test equipment control settings	Equipment under test control settings	Procedure	Performance standard
1	TS-352(*)/U: FUNCTION: AC VOLTS CN-16/U: Selector dial: Maximum counterclockwise. POWER: ON *Note.* Adjust CN-16/U for exactly 115-volt indication on TS-352(*)/U.	POWER: ON BIAS: 0 SHUNT: 0 Selector switches: FILAMENT: Left: H Right: S GRID: 0 PLATE: 0 SCREEN: 0 CATHODE: 2 SUPPRESSOR: 2	*a.* Depress pushbutton 1 — LINE ADJ., adjust LINE ADJUST control until meter pointer is over LINE TEST mark, and note position of LINE ADJUST control. *b.* Rotate FUNCTION SWITCH through positions 1, 2, 3, 4, and 5 while observing neon SHORTS lamp. *c.* Turn POWER switch of CN-16/U to OFF.	*a.* LINE ADJUST control should be near the center of its range of rotation. *b.* Neon SHORTS lamp should light on switch positions 2 and 3. *c.* None.
2	No change from step 1, except: TS-352(*)/U: FUNCTION: 1000 Ω/VDC	No change from end of step 1, except: Selector switches: GRID: 5 PLATE: 3 SCREEN: 4 CATHODE: 6 SUPPRESSOR: 0	*a.* Reconnect equipment as shown in B (1), figure 38; turn POWER switch of CN-16/U to ON. *b.* Depress pushbutton 3 — MUT. COND., note and record multimeter indication. *c.* Reconnect equipment as shown in B (2), figure 38. *d.* Depress pushbutton 3 — MUT. COND.; note and record multimeter indication. *e.* Reconnect equipment as shown in C, figure 38. *f.* Adjust BIAS control to 100; note and record multimeter indication.	*a.* None. *b.* Multimeter should indicate 150 volts ±3. 150 ± 6 *c.* None. *d.* Multimeter should indicate 130 volts ±3. 130 ± 6 *e.* None. *f.* Multimeter should indicate 40 volts ±2 (4 volts ±1-volt F range, TV-7D/U only).

3	TS–352(*)/U: FUNCTION: AC VOLTS	No change from end of step 2, except: FUNCTION switch: B BIAS: 0	*a.* Reconnect equipment as shown in D (1), figure 38.	*a.* None.
			b. Note and record multimeter indication.	*b.* Multimeter should indicate 5 volts ±0.3.
			c. Set FUNCTION SWITCH to C; note and record multimeter indication.	*c.* Multimeter should indicate 5 volts ±0.3.
			d. Reconnect equipment as shown in D (2), figure 38.	*d.* None.
			e. Set FUNCTION SWITCH to D; note and record multimeter indication.	*e.* Multimeter should indicate 1 volt ±0.1.
			f. Set FUNCTION SWITCH to E; note and record multimeter indication.	*f.* Multimeter should indicate 0.5 volt ±0.05.
			g. Set FUNCTION SWITCH to F (TV–7D/U only); note and record multimeter indication.	*g.* Multimeter should indicate +0.5 volt ±0.05.
			h. Turn POWER switch of CN–16/U to OFF.	*h.* None.
4		No changes from end of step 3, except: FILAMENT VOLTAGE: .6	*a.* Reconnect equipment as shown in E (1), figure 38.	*a.* None.
			b. Turn POWER switch of CN–16/U to ON and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*b.* Multimeter should indicate from: (1) 0.65 to 0.76. (2) 0.65 to 0.72 (3) 0.65 to 0.72. (4) 0.65 to 0.72. .62 To .75
			c. Set FILAMENT VOLTAGE switch to 1.1 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*c.* Multimeter should indicate from: (1) 1.05 to 1.15. (2) 1.06 to 1.20. (3) 1.06 to 1.16. (4) 1.06 to 1.16. 1.0 To 1.2
			d. Set FILAMENT VOLTAGE switch to 1.5 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*d.* Multimeter should indicate from: (1) 1.25 to 1.40. (2) 1.28 to 1.42. (3) 1.26 to 1.42. (4) 1.26 to 1.42. 1.21 To 1.47

SEE CHANGES AT C5 (ATTACHED)

e. Set FILAMENT VOLTAGE switch to 2.0 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	e. Multimeter should indicate from: (1) 1.90 to 2.25. (2) 1.90 to 2.25. (3) 1.90 to 2.10. (4) 1.90 to 2.10. 1.80 To 2.2
f. Reconnect equipment as shown in E (2), figure 38.	f. None.
g. Set FILAMENT VOLTAGE switch to 2.5 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	g. Multimeter should indicate from: (1) 2.58 to 2.85. (2) 2.58 to 2.85. (3) 2.58 to 2.85. (4) 2.58 to 2.85. 2.45 To 2.5
h. Set FILAMENT VOLTAGE switch to 3.0 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	h. Multimeter should indicate from: (1) 3.15 to 3.60. (2) 3.25 to 3.60. (3) 3.25 to 3.60. (4) 3.25 to 3.60. 3.09 to 3.
i. Set FILAMENT VOLTAGE switch to 4.3 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	i. Multimeter should indicate from: (1) 4.25 to 4.75. (2) 4.30 to 4.75. (3) 4.30 to 4.75. (4) 4.30 to 4.75. 4.08 To 4
j. Set FILAMENT VOLTAGE switch to 5.0 and note multimeter indication. (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	j. Multimeter should indicate from: (1) 5.15 to 5.65. (2) 5.35 to 5.95. (3) 5.15 to 5.68. (4) 5.15 to 5.68. 4.88 to 5.
k. Set FILAMENT VOLTAGE switch to 6.3 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	k. Multimeter should indicate from: (1) 6.2 to 6.8. (2) 6.6 to 7.2. (3) 6.2 to 6.8. (4) 6.2 to 6.8. 5.85 To 7.1
l. Set FILAMENT VOLTAGE switch to 7.5 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	l. Multimeter should indicate from: (1) 7.35 to 8.1. (2) 7.4 to 8.2. (3) 7.32 to 8.1. (4) 7.32 to 8.1. 6.9 to 8.4

			m. Reconnect equipment as shown in E (3) figure 38.	*m.* None.
			n. Set FILAMENT VOLTAGE switch to 10 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*n.* Multimeter should indicate from: (1) 9.6 to 10.8. (2) 9.8 to 11. (3) 9.6 to 10.8. (4) 9.6 to 10.8. 9.18 To 11.2
			o. Set FILAMENT VOLTAGE switch to 12.6 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*o.* Multimeter should indicate from: (1) 12.3 to 13.5. (2) 12.3 to 13.5. (3) 12.1 to 13.3. (4) 12.1 to 13.3. 11.4 To 14.0
			p. Set FILAMENT VOLTAGE switch to 20 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*p.* Multimeter should indicate from: (1) 19 to 21. (2) 19.8 to 22. (3) 19 to 21. (4) 19 to 21. 18.6 To 22.0
			q. Set FILAMENT VOLTAGE switch to 25 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*q.* Multimeter should indicate from: (1) 25.3 to 28. (2) 26.8 to 28.2. (3) 25.3 to 28. (4) 25.3 to 28. 24.0 To 29.4
			r. Set FILAMENT VOLTAGE switch to 35 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*r.* Multimeter should indicate from: (1) 35.2 to 39. (2) 36.5 to 39.5. (3) 35.2 to 39. (4) 35.2 to 39. 33.4 To 40.6
			s. Reconnect equipment as shown in E (4), figure 38.	*s.* None.
			t. Set FILAMENT VOLTAGE switch to 50 and note multimeter indication: (1) TV–7/U. (2) TV–7A/U. (3) TV–7B/U. (4) TV–7D/U.	*t.* Multimeter should indicate from: (1) 51.5 to 57. (2) 51.5 to 57. (3) 51.5 to 57. (4) 51.5 to 57. 48.9 To 59.

			u. Set FILAMENT VOLTAGE switch to 75 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	*u.* Multimeter should indicate from: (1) 74 to 82. (2) 74 to 82. (3) 74 to 82. (4) 74 to 82. 70.2 To 85.8
			v. Set FILAMENT VOLTAGE switch to 117 and note multimeter indication: (1) TV-7/U. (2) TV-7A/U. (3) TV-7B/U. (4) TV-7D/U.	*v.* Multimeter should indicate from: (1) 116 to 128. (2) 112 to 121. (3) 115 to 127. (4) 115 to 127. 108,9 To 133.

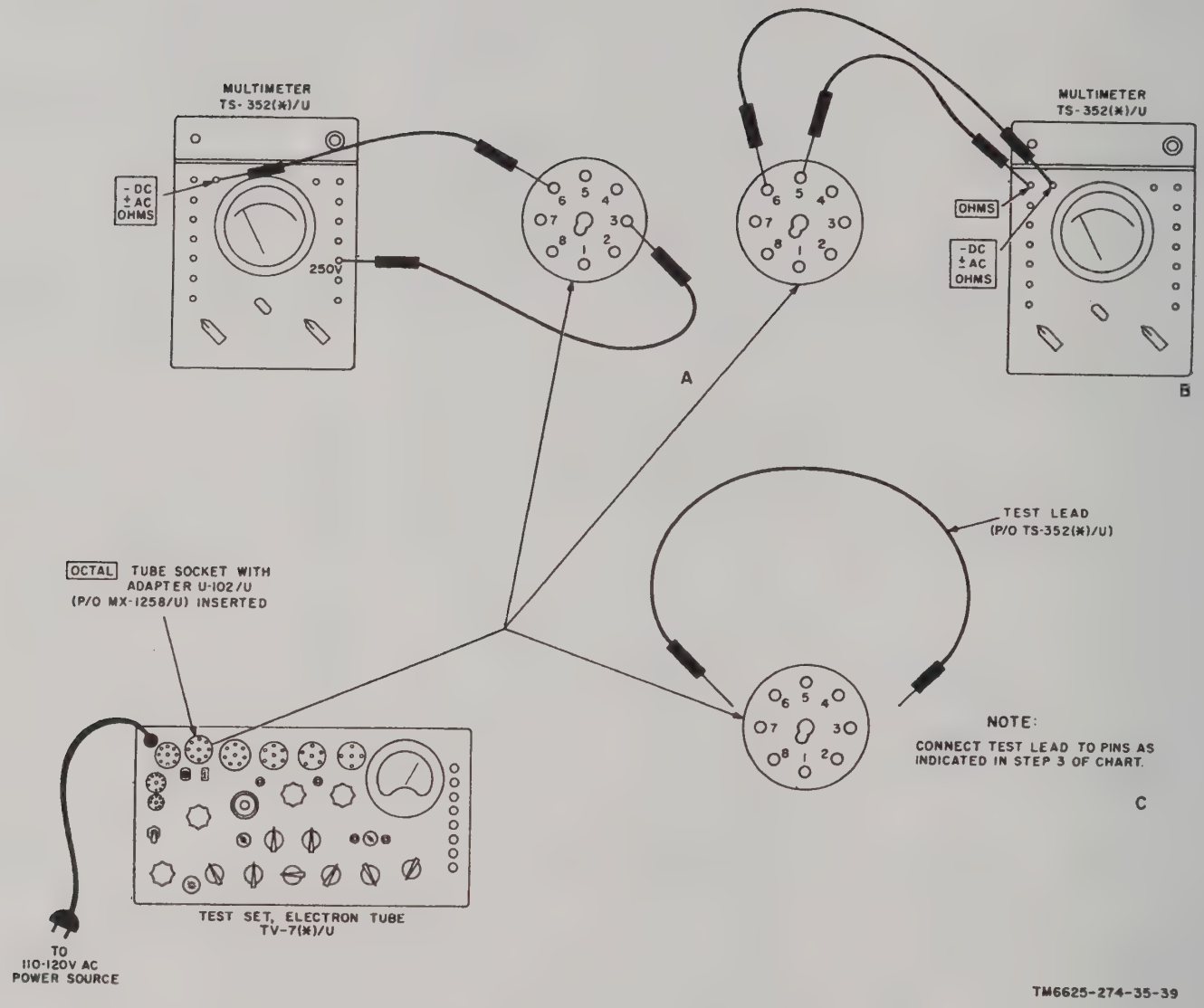

Figure 39. Operational tests.

6L6, and 5678.

Note. All electron tubes used must be known to be good tubes.

b. Test Connections and Conditions. Connect equipment as shown in A, figure 39.

c. Procedure.

37. Operational Tests
(fig. 39)

a. Test Equipment and Material.
(1) Multimeter TS-352(*)/U.
(2) Tube socket Adapter MX-1258/U.
(3) Electron tubes, types 0C3, 5Y3, 6AU6,

Step No.	Test equipment control settings	Equipment under test control settings	Procedure	Performance standard
1	TS-352(*)/U: FUNCTION: AC VOLTS	FILAMENT VOLTAGE: OFF POWER: ON Selector switches: Filament: Left: H Right: S GRID: 5 PLATE: 3 SCREEN: 4 CATHODE: 6 SUPPRESSOR: 0	*a.* Depress pushbutton 4 — GAS 1. Note and record multimeter indication. *b.* Turn POWER switch to OFF; reconnect equipment as shown in (B) figure 39, and set multimeter FUNCTION switch to OHMS and RANGE switch to Rx10000. ***Caution:*** **Do not turn power on during rest of step. Power will damage the multimeter.** *c.* Depress pushbutton 5 — GAS 2. Note and record multimeter indication. *d.* Disconnect all equipment.	*a.* Multimeter should indicate 155 volts ±15.5. *b.* None. *c.* Multimeter should indicate 180,000 ohms ±18,000. *d.* None.
2	None.	POWER: ON LINE ADJUST: Set for meter indication of LINE TEST with pushbutton 1 — LINE ADJ. depressed.	Using the instructions in the test data book, check each of the following electron tubes: 0C3 5Y3 6AU6 6L6 5678	Each of the electron tubes should test above the minimum requirements listed for its type in the test data book.
3	None.	POWER: ON BIAS: 0 SHUNT: 0 FUNCTION SWITCH: 1 Selector switches: FILAMENT: Left: H Right: S GRID: 5 PLATE: 3 SCREEN: 4 CATHODE: 6 SUPPRESSOR: 8	Using the test lead as shown in C, figure 39, make each of the following connections in turn: Rotate the FUNCTION SWITCH through all of the SHORTS positions (for each set of connections). Note and compare the positions of the FUNCTION SWITCH in which the SHORTS lamp lights with the positions listed in the performance standard column. *a.* Connect pins 4 and 8. *b.* Connect pins 5 and 6. *c.* Connect pins 2 and 3. *d.* Connect pins 2 and 5. *e.* Connect pins 2 and 4. *f.* Connect pins 3 and 8. *g.* Connect pins 5 and 8. *h.* Connect pins 4 and 5. *i.* Connect pins 3 and 4. *j.* Connect pins 2 and 8. *k.* Connect pins 2 and 6. *l.* Connect pins 3 and 5.	SHORTS lamp should light at each of the following positions of the FUNCTION SWITCH: *a.* All positions. *b.* 1, 2, 3, and 5. *c.* 1, 2, 4, and 5. *d.* 1, 2, and 5. *e.* 1, 3, 4, and 5. *f.* 1, 4, and 5. *g.* 1 and 5. *h.* 2, 3, and 4. *i.* 2 and 3. *j.* 2. *k.* 3. *l.* 4.

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38. Performance Standard Summary

1. Calibration Test

FUNCTION SWITCH position	*Performance standard*
a. RANGES B.	40 scale divisions ±½
b. RANGES C.	20 scale divisions ±½
c. RANGES D.	40 scale divisions ±½
d. RANGES E.	40 scale divisions ±½
e. RANGES F (TV-7D/U only).	40 scale divisions ±½

2. Voltage Tests

	Performance standard
a. LINE ADJUST control.	Midrange
b. SHORTS lamp.	Lights on 2 and 3
c. Plate voltage.	150 volts ±3 150 ± 6
d. Screen voltage.	130 volts ±3 130 ± 6
e. Bias voltage.	40 volts ±2 (4 volts ~~±1~~ ± 6 °F range, TV-7D/U ONLY
f. Signal voltage.	~~(F range, TV-7D/U only)~~.
(1) Range B.	5 volts ±0.3
(2) Range C.	5 volts ±0.3
(3) Range D.	1 volt ±0.1
(4) Range E.	0.5 volt ±0.05
(5) Range F (TV-7D/U only).	0.5 volt ±0.05

g. Filament voltage:

FILAMENT VOLTAGE switch position	*Performance standard* TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
6	0.65–0.76	0.65–0.72	0.65–0.72	0.65–0.72
10	1.05–1.15	1.06–1.20	1.06–1.16	1.06–1.16
1.5	1.25–1.40	1.28–1.42	1.26–1.42	1.26–1.42
2.0	1.90–2.10	1.90–2.25	1.90–2.10	1.90–2.10
2.5	2.58–2.85	2.58–2.85	2.58–2.85	2.58–2.85
3.0	3.15–3.60	3.15–3.60	3.25–3.60	3.25–3.60
4.3	4.25–4.75	4.30–4.75	4.30–4.75	4.30–4.75
5.0	5.15–5.65	5.35–5.95	5.15–5.68	5.15–5.68
6.3	6.20–6.80	6.60–7.20	6.20–6.80	6.20–6.80
7.5	7.35–8.10	7.40–8.20	7.32–8.10	7.32–8.10

FILAMENT VOLTAGE switch position	*Performance standard* TV-7/U	TV-7A/U	TV-7B/U	TV-7D/U
10	9.60–10.8	9.80–11.0	9.60–10.8	9.60–10.8
12.6	12.3–13.5	12.3–13.5	12.1–13.3	12.1–13.3
20	19.0–21.0	19.8–22.0	19.0–21.0	19.0–21.0
25	25.3–28.0	26.8–28.2	25.3–28.0	25.3–28.0
35	35.2–39.0	36.5–39.5	35.2–39.0	35.2–39.0
50	51.5–57.0	51.5–57.0	51.5–57.0	51.5–57.0
75	74.0–82.0	74.0–82.0	74.0–82.0	74.0–82.0
117	116–128	112–121	115–127	115–127

3. Operational Tests

a. Gas tests.	*Performance standard*
(1) GAS 1.	155 volts ac ±15.5
(2) GAS 2.	180,000 ohms ±18,000

b. SHORTS lamp tests.	*Performance standard*
(1) Screen to suppressor (pins 4 and 8).	All positions
(2) Control grid to cathode (pins 5 and 6).	1, 2, 3, and 5
(3) Filament to plate (pins 2 and 3).	1, 2, 4, and 5
(4) Filament to control grid (pins 2 and 5).	1, 2, and 5
(5) Filament to screen (pins 2 and 4).	1, 3, 4, and 5
(6) Plate to suppressor (pins 3 and 8).	1, 4, and 5
(7) Control grid to suppressor (pins 5 and 8).	1 and 5
(8) Screen to control grid (pins 4 and 5).	2, 3, and 4
(9) Plate to screen (pins 3 and 4).	2 and 3
(10) Filament to suppressor (pins 2 and 8).	2
(11) Filament to cathode (pins 2 and 6).	3
(12) Plate to control grid (pins 3 and 5).	4

Superceded by attached SEE CS!

Section II. FINAL TESTING

39. Purpose of Final Testing

The final tests are designed to measure the performance capability of a repaired equipment. Equipment that meets the minimum standards stated in the referenced tests will furnish satisfactory operation, equivalent to that of new equipment.

40. Final Tests

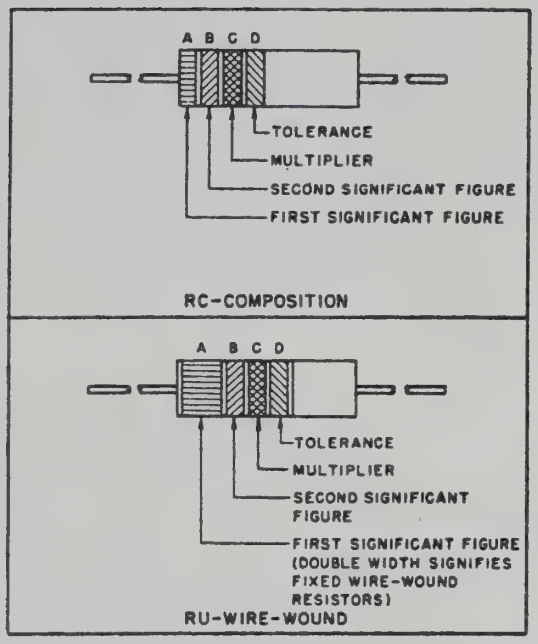
There are no separate final tests for the TV-7(*)/U.

a. If the results of the tests in paragraphs 22, 23, 24, and 36, steps 3 and 4, are within the limits specified for each test, the equipment will furnish satisfactory operation, equivalent to that of new equipment.

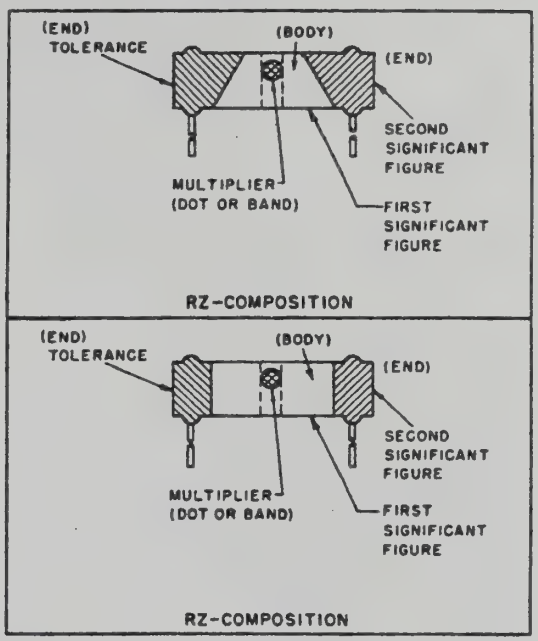
b. If a second TV-7(*)/U is available, make a comparison check. Test several known good tubes in the test set that has been repaired; then test the same tubes in the second test set. Compare the results. If the pointers of both equipment meters indicate the same or nearly the same, the repaired test set may be returned to service.

RESISTOR COLOR CODE MARKING
(MIL-STD RESISTORS)

AXIAL-LEAD RESISTORS (INSULATED)



RADIAL-LEAD RESISTORS (UNINSULATED)



RESISTOR COLOR CODE

BAND A OR BODY*		BAND B OR END*		BAND C OR DOT OR BAND*		BAND D OR END*	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1	BODY	± 20
BROWN	1	BROWN	1	BROWN	10	SILVER	± 10
RED	2	RED	2	RED	100	GOLD	± 5
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000		
GREEN	5	GREEN	5	GREEN	100,000		
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7				
GRAY	8	GRAY	8	GOLD	0.1		
WHITE	9	WHITE	9	SILVER	0.01		

*FOR WIRE-WOUND-TYPE RESISTORS, BAND A SHALL BE DOUBLE-WIDTH. WHEN BODY COLOR IS THE SAME AS THE DOT (OR BAND) OR END COLOR, THE COLORS ARE DIFFERENTIATED BY SHADE, GLOSS, OR OTHER MEANS.

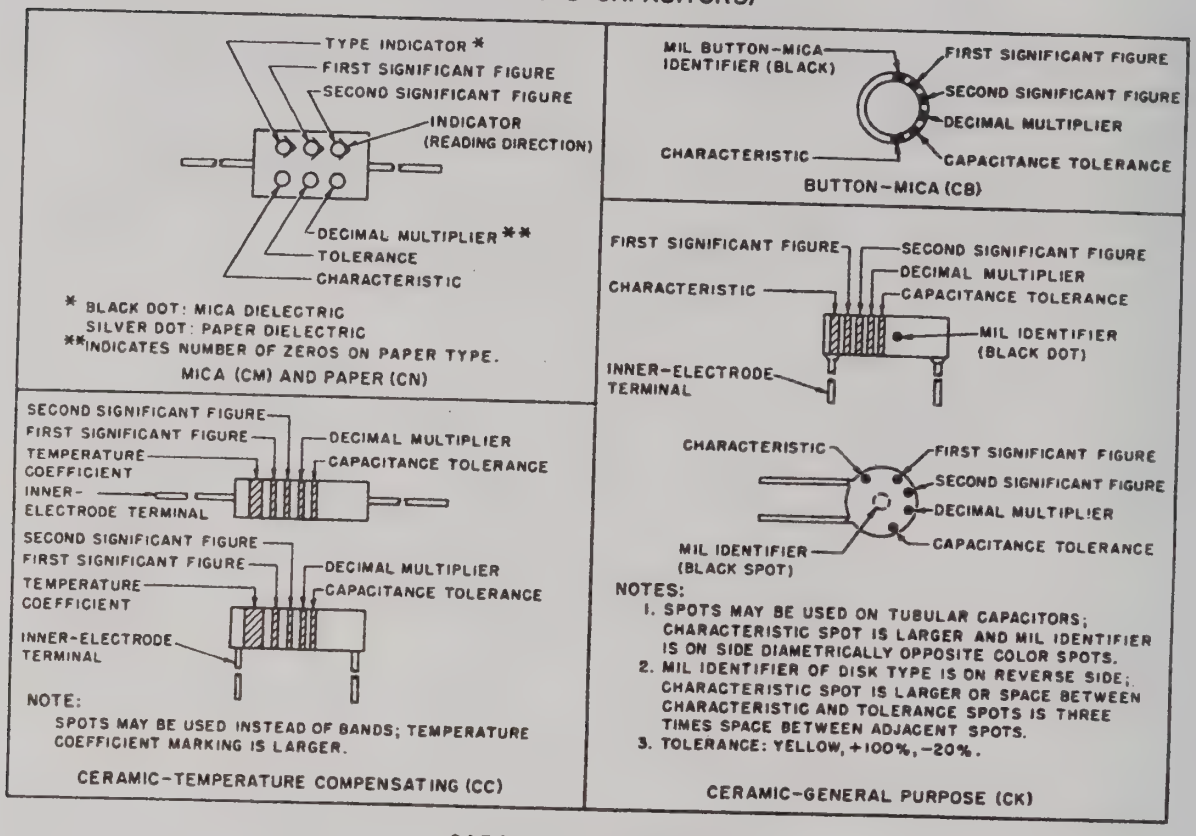
EXAMPLES (BAND MARKING):
10 OHMS ±20 PERCENT: BROWN BAND A; BLACK BAND B; BLACK BAND C; NO BAND D.
4.7 OHMS ±5 PERCENT: YELLOW BAND A; PURPLE BAND B; GOLD BAND C; GOLD BAND D.

EXAMPLES (BODY MARKING):
10 OHMS ±20 PERCENT: BROWN BODY; BLACK END; BLACK DOT OR BAND; BODY COLOR ON TOLERANCE END.
3,000 OHMS ±10 PERCENT: ORANGE BODY; BLACK END; RED DOT OR BAND; SILVER END.

STD-R1

Figure 40. MIL-STD resistor color code markings.

CAPACITOR COLOR CODE MARKING
(MIL-STD CAPACITORS)



CAPACITOR COLOR CODE

COLOR	SIG FIG.	MULTIPLIER		CHARACTERISTIC[1]				TOLERANCE [2]					TEMPERATURE COEFFICIENT (UUF/UF/°C)
		DECIMAL	NUMBER OF ZEROS	CM	CN	CB	CK	CM	CN	CB	CC		
											OVER 10UUF	10UUF OR LESS	CC
BLACK	0	1	NONE		A			20	20	20	20	2	ZERO
BROWN	1	10	1	B	E	B	W				1		-30
RED	2	100	2	C	H		X	2		2	2		-80
ORANGE	3	1,000	3	D	J	D			30				-150
YELLOW	4	10,000	4	E	P								-220
GREEN	5		5	F	R						5	0.5	-330
BLUE	6		6		S								-470
PURPLE (VIOLET)	7		7		T	W							-750
GRAY	8		8			X						0.25	+30
WHITE	9		9								10	1	-330(±500) [3]
GOLD		0.1						5		5			+100
SILVER		0.01						10	10	10			

1. LETTERS ARE IN TYPE DESIGNATIONS GIVEN IN MIL-C SPECIFICATIONS.
2. IN PERCENT, EXCEPT IN UUF FOR CC-TYPE CAPACITORS OF 10 UUF OR LESS.
3. INTENDED FOR USE IN CIRCUITS NOT REQUIRING COMPENSATION.

STD-CI

Figure 41. MIL-STD capacitor color code markings.

FILAMENT SELECTOR SWITCH S107

SWITCH POSITION	CONTACTS MADE									
	SECT. A		SECT. B		SECT. C		SECT. D		SECT. E	
	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
A	B-D	C-E	D-F	E-G	F-H	G-J	H-K	J-L	K-A	—
B	—	C-E	D-F	E-G	F-H	G-J	H-K	J-L	K-A	M-B
C	B-D	—	D-F	E-G	F-H	G-J	H-K	J-L	K-A	M-C
D	B-D	C-E	—	E-G	F-H	G-J	H-K	J-L	K-A	M-D
E	B-D	C-E	D-F	—	F-H	G-J	H-K	J-L	K-A	M-E
F	B-D	C-E	D-F	E-G	—	G-J	H-K	J-L	K-A	M-F
G	B-D	C-E	D-F	E-G	F-H	—	H-K	J-L	K-A	M-G
H	B-D	C-E	D-F	E-G	F-H	G-J	—	J-L	K-A	M-H
J	B-D	C-E	D-F	E-G	F-H	G-J	H-K	—	K-A	M-J
K	B-D	C-E	D-F	E-G	F-H	G-J	H-K	J-L	—	M-K

FILAMENT VOLTAGE SWITCH S108

SWITCH POSITIONS	CONTACT MADE	
	FRONT	REAR
OFF	—	—
BLST	A-B	C-BLST
.6	A-B	C-.6
1.1	A-B	C-1.1
1.5	A-B	C-1.5
2.0	A-B	C-2.0
2.5	A-B	C-2.5
3.0	A. B	C-3.0
4.3	A-B	C-4.3
5.0	A-B	C-5.0
6.3	A-B	C-6.3
7.5	A-B	C-7.5
10	A-B	C-10
12.6	A-B	C-12.6
20	—	C-20
25	—	C-25
35	—	C-35
50	—	C-50
75	—	C-75
117	—	C-117

FUNCTION SWITCH S109

SWITCH POSITION	CONTACTS MADE							
	SECT.A		SECT. B		SECT. C		SECT.D	
	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
1	3-X	A-D	3-X	A-D	3-X	A-D	3-X	A-D
2	3-X	A-D	3-X	A-D	3-X	A-D	3-X	A-D
3	3-X	A-D	3-X	A-D	3-X	A-D	3-X	A-D
4	3-X	A-D	3-X	A-D	3-X	A-D	3-X	A-D
5	3-X	A-D	3-X	A-D	3-X	A-D	3-X	A-D
A	3-5	F-D	3-5	F-D	3-5	F-D	—	F-D
B	3-5	F-D	3-5	F-D	3-5	F-D	—	F-D
C	3-5	F-D	3-5	F-D	3-5	F-D	—	F-D
D	3-5	F-D	3-5	F-D	3-5	F-D	—	F-D
E	3-5	F-D	3-5	F-D	3-5	F-D	—	F-D

FUNCTION SWITCH S109 CONT.

SWITCH POSITION	CONTACTS MADE			
	SECT. E		SECT. F	
	FRONT	REAR	FRONT	REAR
1	B,C,D,E,F,X-1,2,3,4,5,A	—	F,X-5,A	3,4-C,D
2	C,D,E,F,X,1-2,3,4,5,A,B	—	F,X-5,A	1,3,4-C,D
3	D,E,F,X,1,2-3,4,5,A,B,C	—	F,X-5,A	3,4-C,D
4	E,F,X,1,2,3-4,5,A,B,C,D	—	F,X-5,A	3,4-C,D
5	F,X,1,2,3,4-5,A,B,C,D,E	—	—	4-D
A	A,B,C,D,E,F-X,1,2,3,4,5	A-5	B,F-1,5	E,3-C,5
B	B,C,D,E,F,X-1,2,3,4,5,A	A-5	F,X-5,A	3,4-C,D
C	C,D,E,F,X,1-2,3,4,5,A,B	A-5	F,X-5,A	1,3,4-C,D
D	D,E,F,X,1,2-3,4,5,A,B,C	A-B	F,X-5,A	3,4-C,D
E	E,F,X,1,2,3-4,5,A,B,C,D	A-B-C	F,X-5,A	3,4-C,D

SUPPRESSOR SELECTOR SWITCH S101

SWITCH POSITION	CONTACTS MADE
	SECT. A
0	—
1	11-1
2	11-2
3	11-3
4	11-4
5	11-5
6	11-6
7	11-7
8	11-8
9	11-9

CATHODE SELECTOR SWITCH S102

SWITCH POSITION	CONTACTS MADE
	SECT. A
0	—
1	11-1
2	11-2
3	11-3
4	11-4
5	11-5
6	11-6
7	11-7
8	11-8
9	11-9

SCREEN SELECTOR SWITCH S103

PLATE SELECTOR SWITCH S104 GRID SELECTOR SWITCH S105

SWITCH POSITION	CONTACTS MADE									
	SECT. A		SECT. B		SECT. C		SECT. D		SECT. E	
	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
0	1-3	2-4	3-5	4-6	5-7	6-8	7-9	8-10	0-9	—
1	—	2-4	3-5	4-6	5-7	6-8	7-9	8-10	0-9	11-1
2	1-3	—	3-5	4-6	5-7	6-8	7-9	8-10	0-9	11-2
3	1-3	2-4	—	4-6	5-7	6-8	7-9	8-10	0-9	11-3
4	1-3	2-4	3-5	—	5-7	6-8	7-9	8-10	0-9	11-4
5	1-3	2-4	3-5	4-6	—	6-8	7-9	8-10	0-9	11-5
6	1-3	2-4	3-5	4-6	5-7	—	7-9	8-10	0-9	11-6
7	1-3	2-4	3-5	4-6	5-7	6-8	—	8-10	0-9	11-7
8	1-3	2-4	3-5	4-6	5-7	6-8	7-9	—	0-9	11-8
9	1-3	2-4	3-5	4-6	5-7	6-8	7-9	8-10	—	11-9

FILAMENT SELECTOR SWITCH S106

SWITCH POSITION	CONTACTS MADE									
	SECT. A		SECT. B		SECT. C		SECT. D		SECT. E	
	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR	FRONT	REAR
P	R-T	S-U	T-V	U-W	V-X	W-Y	X-Z	Y-1	P-Z	—
R	—	S-U	T-V	U-W	V-X	W-Y	X-Z	Y-1	P-Z	2-R
S	R-T	—	T-V	U-W	V-X	W-Y	X-Z	Y-1	P-Z	2-S
T	R-T	S-U	—	U-W	V-X	W-Y	X-Z	Y-1	P-Z	2-T
U	R-T	S-U	T-V	—	V-X	W-Y	X-Z	Y-1	P-Z	2-U
V	R-T	S-U	T-V	U-W	—	W-Y	X-Z	Y-1	P-Z	2-V
W	R-T	S-U	T-V	U-W	V-X	—	X-Z	Y-1	P-Z	2-W
X	R-T	S-U	T-V	U-W	V-X	W-Y	—	Y-1	P-Z	2-X
Y	R-T	S-U	T-V	U-W	V-X	W-Y	X-Z	—	P-Z	2-Y
Z	R-T	S-U	T-V	U-W	V-X	W-Y	X-Z	Y-1	—	2-Z

Figure 44(1). Test Set, Electron Tube TV-7D/U, schematic diagram (sheet 1).

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful when working on the 330- and 154-volt ac power supply circuits, on the 115-volt ac line connections, and on terminal board E106. Serious injury or death may result from contact with these points.

DON'T TAKE CHANCES!

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5th USASA Fld Sta (5)
9th USASA Fld Sta (5)
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Units organized under following TOE's (2 each) :

11-6, 11-7, 11-8, 11-35, 11-36, 11-37, 11-38, 11-39, 11-45, 11-46, 11-56, 11-57, 11-58, 11-85, 11-86, 11-87, 11-95, 11-96, 11-97, 11-98, 11-99, 11-106, 11-106, 11-117, 11-127, 11-137, 11-147, 11-155, 11-156, 11-157, 11-158, 11-215, 11-216, 11-217, 11-218, 11-225, 11-226, 11-237, 11-247, 11-347, 11-357, 11-358, 11-377

11-500 (FH, FJ, FK, FO, FP, FQ, FR, GH, GI, GJ, GR, KA, KC, NA, NB, NC, RA, RB, RC, RD, RE, RF, RH, RI, RK, RL, RM, RN-RU, TC, TE, TF, TG, TK)

11-587, 11-592, 11-597, 11-608

NG: State AG (3) ; units-same as Active Army except allowance is one copy to each unit.

USA R: None.

For explanation of abbreviations used, see AR 320-50.

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907-707

Figure 44(2) (sheet 2), switch S109, section F. Delete the connection between contacts D and E and substitute 2 connections between C and E.

Appendix. (As changed by C 3, 13 Dec 63) Delete DA Pam 310-4, MWO 6625-274-35/1, TM 11-2661, and TM 11-5132 and substitute:

DA Pam 310-4.. Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.

TB SIG 355-1_ _ Depot Inspection Standard for Repaired Signal Equipment.

TB SIG 355-2 _ _ Depot Inspection Standard for Refinishing Repaired Signal Equipment.

TB SIG 355-3 -- Depot Inspection Standard for Moisture and Fungus Resistant Treatment.

TM 11-6625-316-12 ------- Operator and Organizational Maintenance Manual: Test Sets, Electron Tube TV-2/U, TV-2A/U, TV-2B/U, and TV-2C/U.

TM 11-6625-320-12 ------- Organizational Maintenance Manual: Voltmeter, Meter ME-30A/U and Voltmeters, Electronic ME-30B/U, ME-30C/U, and ME-30E//U.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major Genaral, United States Amy,
The Adjutant General.

Changes in force: C 4 and C 5

TM 11-6625-274-35
C 5

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 30 March 1976

Direct Support, General Support, and Depot Maintenance Manual
TEST SETS, ELECTRON TUBE TV-7/U,
TV-7A/U, TV-7B/U, AND TV-7D/U

TM 11-662527435, 30 June 1960, is changed as follows:

Pages, paragraph 1b lines 2 and 3. "TM 11-6625-274-12P and TM 11-6625-274-35P" is changed to read "TM 11-6625-274-25P.'

Subparagraph c is superseded as follows:

c. You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

Page 9, paragraph 7b(2), line 9. Change "121" to read "117."

Page 49, paragraph 36c, chart, performance standard column. Make the following changes:

Step 2b. Change "150 volts ±3" to read "150 volts ±6."

Step 2d. Change "130 volts ±3" to read "130 volts ±6."

Step 4, Performance stardard column:

b(4). Change "0.65 to 0.72" to read "0.62 to 0.75."

c(4). Change "1.06 to 1.16" to read "1.00 to 1.22."

d(4). Change "1.26 to 1.42" to read "1.21 to 1.47."

e(4). Change "1.90 to 2.10" to read "1.80 to 2.20."

g(4). Change "2.58 to 2.85" to read "2.45 to 2.99."

h.(4). Change "3.25 to 3.60" to read "3.09 to 3.77."

i(4). Change "4.30 to 4.75" to read "4.08 to 4.98."

j(4). Change "5.15 to 5.68" to read "4.88 to 5.96."

k(4). Change "6.2 to 6.8" to read "5.85 to 7.15."

l(4). Change "7.32 to 8.1" to read "6.94 to 8.48."

n(4). Change "9.6 to 10.8" to read "9.18 to 11.22."

o(4). Change "12.1 to 13.3" to read "11.4 to 14.0."

p(4). Change "19 to 21" to read "18.0 to 22.0."

q(4). Change "25.3 to 28" to read "24.0 to 29.4."

r(4). Change "35.2 to 39" to read "33.4 to 40.8."

t(4). Change "51.5 to 57" to read "48.9 to 59.7."

u(4). Change "74 to 82" to read "70.2 to 85.8."

v(4). Change "115 to 127" to read "108.9 to 133.1."

Page 51, paragraph 38, Performance standard column. Make the following changes:

2c. Change "150 volts ±3" to read "150 volts ±6."

2d. Change "130 volts±3" to read "130 volts to ± 6."

2e. Change "40 volts ±2 (4 volts ± 1)" to read "40 volts ±2 (4 volts ± (F range, TV-7D/U only))."

2f. Delete "(F range, TV-7D/U only))."

2g. The chart is superseded as follows:

g. Filament Voltage.

Filament voltage switch position	TV-7/U	Performance standard TV-7A/U	TV-7B/U	TV-7D/U
.6	0.65-0.76	0.65-0.72	0.65-0.72	0.62 to 0.75
1.1	1.05-1.15	1.06-1.20	1.06-1.16	1.00 to 1.22
1.5	1.25-1.40	1.28-1.42	1.26-1.42	1.21 to 1.47
2.0	1.90-2.10	1.90-2.25	1.90-2.10	1.80 to 2.20
2.5	2.58-2.85	2.58-2.85	2.58-2.85	2.45 to 2.99
3.0	3.15-3.60	3.15-3.60	3.25-3.60	3.09 to 3.77
4.3	4.25-4.75	4.30-4.75	4.30-4.75	4.08 to 4.98
5.0	5.15-5.65	5.35-5.95	5.15-5.68	4.88 to 5.96
6.3	6.20-6.80	6.60-7.20	6.20-6.80	5.85 to 7.15
7.5	7.35-8.10	7.40-8.20	7.32-8.10	6.94 to 8.48
10	9.60-10.8	9.80-11.0	9.60-10.8	9.16 to 11.22
12.6	12.3-13.5	12.3-13.5	12.1-13.3	11.4 to 14.0
20	19.0-21.0	19.8-22.0	19.0-21.0	18.0 to 22.0
25	25.3-28.0	26.8-28.2	25.3-28.0	24.0 to 29.4
35	35.2-39.0	36.5-39.5	35.2-39.0	33.4 to 40.8
50	51.5-57.0	51.5-57.0	51.5-57.0	48.9 to 59.7
75	74.0-82.0	74.0-82.0	74.0-82.0	70.2 to 85.8
117	116-128	112-121	115-127	108.9 to 133.1

Page *55, appendix.* Delete "TM 11-6625-274-20P" and "TM 11-6625-274-35P" in their entirety and substitute:

TM 11-6625-274-25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tool Lists: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.

TM 11-6625-274-35
*C 4

CHANGE
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *8 July 1966*

DS, GS, and Depot Maintenance Manual

TEST SETS, ELECTRON TUBE TV-7/U, TV-7A/U, TV-7B/U, AND TV-7D/U

TM 11–6625-274-35, 30 June 1960, is changed as follows:

Page S. paragraph 1. Make the following changes:

Delete subparagraph c as changed by C 3, 13 December 1963, and Substitute:

c. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA. Form 2028 (Remmmended Changes to DA Publications) will be used for reporting these improvement recommendations. This form will be completed using pencil, pen, or typewriter and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-MR-NMP-AD, Fort Monmouth, N.J. 07703.

Delete paragraph 1.1 as added by C 3,13 December 1963, and substitute:

1.1. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment. DA Pam 310-4 is an index of current technical manuals, technical bulletins, supply manuals (types 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders available through publications supply channels. The index lists the individual parts (-10, -20, -35P, etc.) and the latest changes to and revisions of each equipment publication.

Page 21, paragraph 16c, chart, step 3, "Correction" column, item 2. (As changed by C 3, 13 Dec 63) Change "resistance of" to transformer.

Page 38. (As changed by C 3,13 Dec 63) Delete paragraph 17 and substitute:

17. Dc Resistance of Transformer T101

The dc resistances of the transformer windings should be checked when the sc voltage readings vary from those shown in figures 42②, 43, and 44②. Resistance measurements are taken to locate shorts between windings, shorts to ground, open windings, and high resistance connetions. The dc resistances of the transformer windings will vary widely with each manufacturer's design and should not be the determining factor for re-replacement. Typical measurements taken from three different Test Sets, Electron Tube TV-7 (•)/U are shown in the following chart:

Terminals	Transformer a (ohms)	Transformer b (ohms)	Transformer c (ohms)
1-2	12.5	2.5	10
3-5	Less than 1	Less than 1	Less than 1
6-8	Less than 1	Less than 1	Less than 1
9-10	75	45	80
11-12	75	42	70
11-13	80	48	78
14-15	3	1	3
16-17	140	120	150
16-18	270	250	300
19-31	Less than 1	Less than 1	Less than 1
19-32	3	2.5	2.5
19-33	6	5	4
19-34	10	7.5	7
19-35	17	12	10.5
19-36	26	19	16
19-37	42	31	26

Page 39, paragraph 22. (As changed by C 3,18 Dee. 63) Change paragraph 22 to 23 and add the following note after the paragraph heading.

Note. Be sure to perform the plate voltage and line adjust circuit test before performing the blat voltage test.

Page 40, paragraph 23. (As changed by C 3, 13 Dec. 63) Change paragraph 23 to 22, and add the following note after the paragraph heading:

Note. Be sure to perform the plate voltage and line adjust circult test before performing the blas voltage test.

*The change superedes, C 3 December 1963.

Page 60, paragraph 37. (As changed by C 3, 13 Dec 63) Make the following changes:

Subparagraph a(3). Add: and 12AT7.

Subparagraph C, chart, step No. 1, "Performance standard" column. Delete sulparagraph c and substitute:

c. Multimeter should indicate 180,000 ohms ± 18,000 when testing TV-7/U, TV-7A/U, and TV-7B/U. When testing TV-7D/U, the multimeter should read 180,000 ohms ±10 percent when the FUNCTION SWITCH is set to A, B, C, D, or E. position. When the FUNCTION SWITCH is set to the F position, the multimeter should read 37,300 ohms ±10 percent.

Step. No. 2, "Procedure" column. Add 12AT7.

Step No. 3, "Equipment under test control settings" column. After "SUPPRESSOR: 8", add FILAMENT VOLTAGE: Any position other than OFF or BLST.

Page 52. Add chapter 5 after chapter 4:

CHAPTER 5

DEPOT OVERHAUL STANDARDS

41. Applicability of Depot Overhaul Standards

The tests outlined in this chapter are designed to measure the perfomance capability of a repaired equipment. Equipment that is returned to stock should meet the standards given in these tests.

42. Applicable References

a. Repair Standard. Applicable procedures of the Army depots performing this test and the general standards for repaired test equipment given in TB SIG 355-1, TB SIG 355-2, and TB SIG 355-3 form a part of the requirements for testing this equipment.

b. Technical Publication. The technical publication applicable to the equipment to be tested is indicated below.

Title	*Number*
Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7\U, TV-7A/U, TV-7B/U, and TV-TD/U.	TM 11-6625-274-12

c. Modification Work Orders. Perform all modification work orders applicable to this equipment before making the tests specified. DA Pam 810-4 lists all available MWO's.

43. Test Facilities Required

The following items are required for depot testing:

Item	Technical manual	Common name
Multimeter TS-352(*)/U.	TM 11-5527 . . .	Multimeter.
Voltmeter, Meter ME-30A/U, or Voltmeter, Electronic ME-30B/U or ME-30C/U.	TM 11-6625-320-12.	Voltmeter.
Decade Resistor ZM-16/U.	TM 11-5102.	
Tube Socket Adapter MX-1258/U.	----------	Tube socket adapter.
Variable Transformer CN-16/U.	----------	Variable transformer.

44. General Test Requirments

All tests will be conducted under the following conditions:

a. Tests will be made at room temperature.

b. The equipment will be on at least 20 minutes before tests are made.

45. Calibration Test

Perform the test indicated in paragraph 35.

46. Voltage Tests

Perform the tests indicated in paragraph 36.

47. Operational Tests

Perform the tests indicated in paragraph 87.

Page 55. Make the following changes:

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12–7 requirements for TM 11 Series (UNCL), plus the following additional formula:

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CNGB (1)	11–45
Def Atomic Spt Agcy (5)	11–46
Tech Stf, DA (1) except	11–47
CSigO (18)	11–55
USA Abn & Elct Bd (1)	11–56
USA ATB (1)	11–57
US ARADCOM (2)	11–58
US ARADCOM Rgn (2)	11–95
MDW (1)	11–96
Seventh, US Army (5)	11–97
EUSA (5)	11–98
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11–15	11–558
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11–17	11–592
11–18	11–597
11–37	11–608
11–38	

NG: State AG (3); Units — Same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used see AR 320–50.

☆ U.S GOVERNMENT PRINTING OFFICE: 1960—570981/3

APPENDIX
REFERENCES

Following is a list of applicable references available to the field and depot maintenance repairman of Test Set, Electron Tube TV-7(*)/U:

DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
MWO 6625-274-35/1	Modification of Electronic Tube Test Set TV-7/U to Enable Proper Short Test at Line Frequencies Higher Than 60 Cps.
NAVSHIPS 91798	Tube Socket Adapter Kit MX-1258/U for General Electronics Use.
TA 11-17	Signal Field Maintenance Shops.
TA 11-100 (11-17)	Allowances of Signal Corps Expendable Supplies for Signal Field Maintenance Shops.
TM 11-2661	Electron Tube Test Sets TV-2/U, TV-2A/U, and TV-2B/U.
TM 11-5102	Resistors, Decade ZM-16/U and ZM-16A/U.
TM 11-5132	Voltmeter, Meter ME-30A/U and Voltmeters, Electronic ME-30B/U and ME-30C/U.
TM 11-5527	Multimeters TS-352/U, TS-352A/U, and TS-352B/U.
TM 11-5540	Electric Light Assembly MX-1292/PAQ.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual, Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-274-35P	Field and Depot Maintenance Repair Parts and Special Tools List for Test Sets, Electron Tube TV-7/U, TV-2A/U, TV-2B/U, and TV-2D/U.

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TM 11-5132	Voltmeter, Meter ME-30A/U and Voltmeters, Electronic ME-30B/U and ME-30C/U.
TM 11-5527	Multimeters TS-352/U, TS-352A/U, and TS-352B/U.
TM 11-5540	Electric Light Assembly MX-1292/PAQ.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual, Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-274-35P	Field and Depot Maintenance Repair Parts and Special Tools List for Test Sets, Electron Tube TV-7/U, TV-2A/U, TV-2B/U, and TV-2D/U.

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MWO 6625-274-35/1	Modification of Electronic Tube Test Set TV-7/U to Enable Proper Short Test at Line Frequencies Higher Than 60 Cps.
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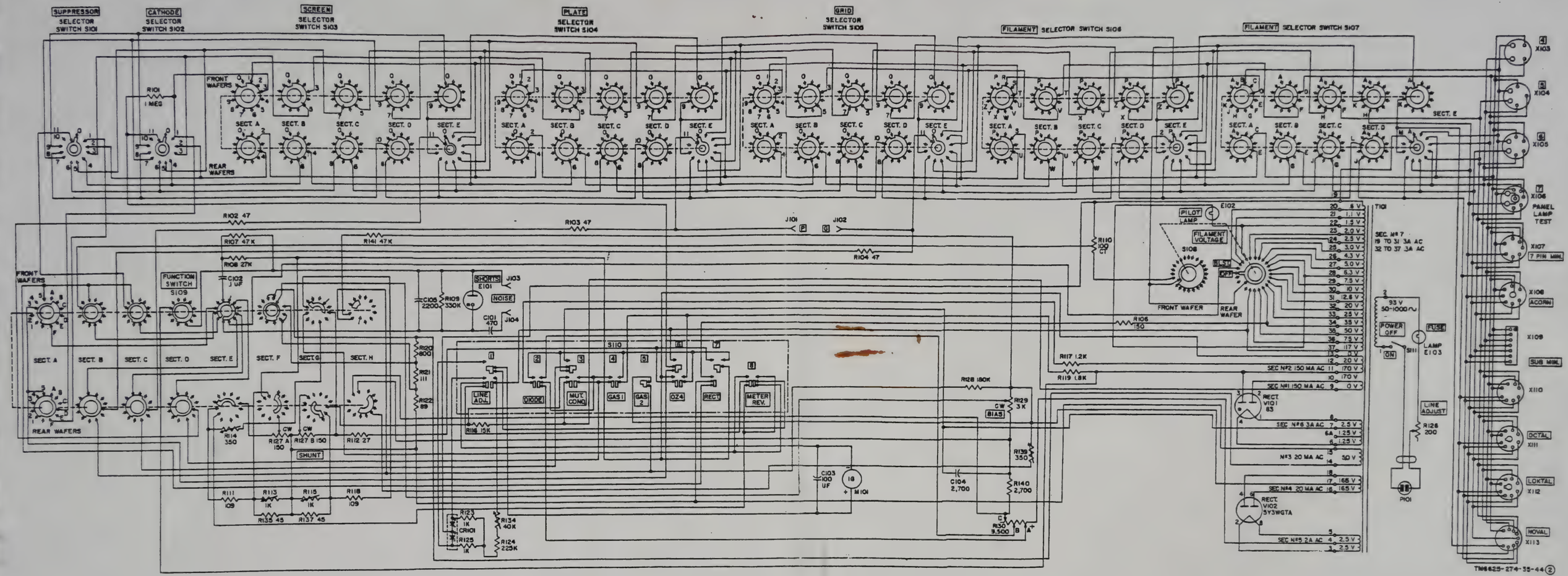
TM 11-6625-274-20P	Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-274-35P	Field and Depot Maintenance Repair Parts and Special Tools List for Test Sets, Electron Tube TV-7/U, TV-2A/U, TV-2B/U, and TV-2D/U.



NOTES:

1. UNLESS OTHERWISE INDICATED RESISTANCES ARE IN OHMS AND CAPACITANCES ARE IN UUF
2. ALL SOCKETS ARE VIEWED FROM THE BOTTOM.
3. ALL ROTARY SWITCH SECTIONS ARE SHOWN IN THE EXTREME COUNTER-CLOCKWISE POSITION VIEWED FROM THE FRONT OR KNOB END OF THE SWITCH. SECTION A IS CLOSEST TO KNOB END.
4. 1 THROUGH 8 ARE PUSH BUTTON SWITCHES.
5. THE VOLTAGES AT TRANSFORMER T101 WILL VARY, DEPENDING UPON THE SETTING OF RESISTOR R126.
6. ▭ DENOTES EQUIPMENT MARKINGS.

Figure 44(2). Test Set, Electron Tube TV-7D/U, schematic diagram (sheet 2).

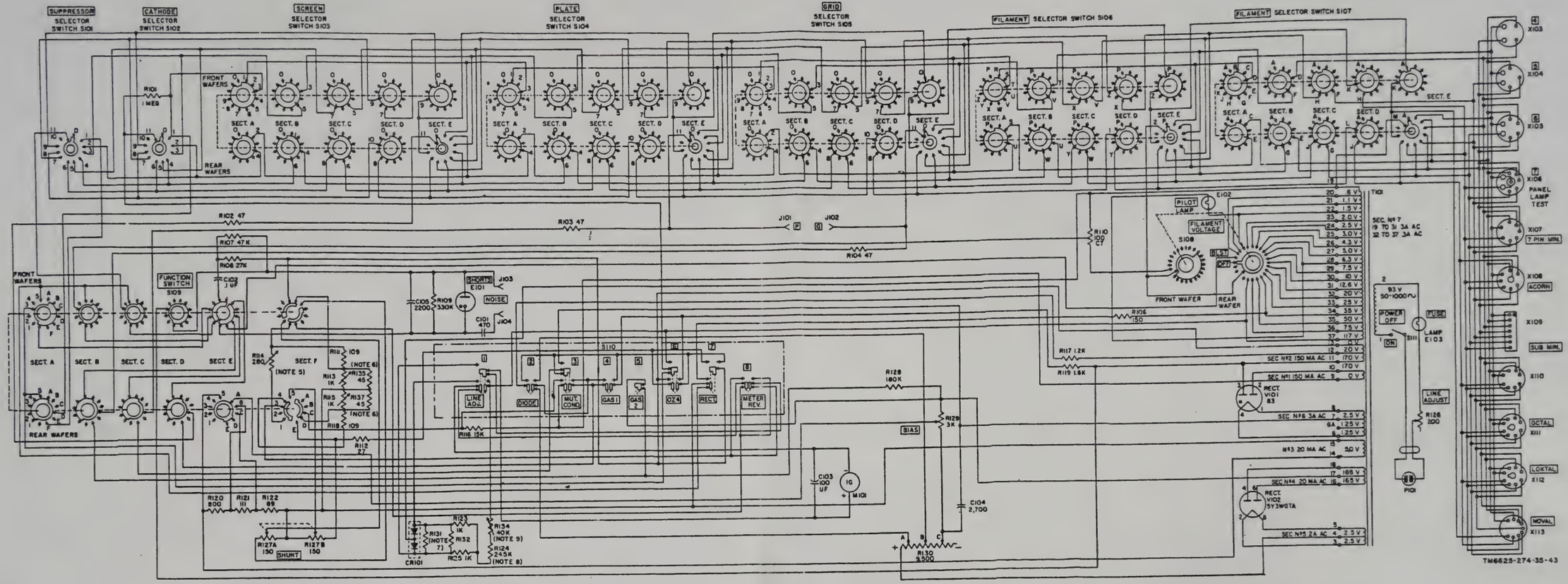


Figure 43. Test Sets, Electron Tube TV-7A/U (serial numbers 1201 through 9492) and TV-7B/U, schematic diagram.

NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS AND CAPACITANCES ARE IN UUF.
2. ALL SOCKETS ARE VIEWED FROM THE BOTTOM.
3. ALL ROTARY SWITCH SECTIONS ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION VIEWED FROM FRONT OR KNOB END OF SWITCH. SECTION A IS CLOSEST TO KNOB END.
4. [1] THROUGH [8] ARE PUSH BUTTON SWITCHES.
5. RESISTOR R114 HAS A VALUE OF 350 OHMS ON TV-7B/U.
6. RESISTORS R135 AND R137 ARE DESIGNATED AS RESISTORS R134 AND R135, RESPECTIVELY, ON TV-7A/U, SERIAL NUMBERS 1201 THROUGH 9492.
7. THE VALUES OF RESISTORS R131 AND R132 ARE DETERMINED IN PRODUCTION. IF USED, THE RESISTANCE RANGE IS 10K TO 20K. THESE RESISTORS ARE NOT USED ON TV-7B/U.
8. RESISTOR R124 HAS A VALUE OF 225K OHMS ON TV-7B/U.
9. VARIABLE RESISTOR R134, 40K OHMS, IS NOT USED ON TV-7A/U SERIAL NUMBERS 1201 THROUGH 9492.
10. THE VOLTAGES AT TRANSFORMER T101 WILL VARY DEPENDING UPON THE SETTING OF RESISTOR R126.
11. REFER TO TV-7/U AND TV-7A/U (SERIAL NUMBERS 1 THROUGH 1200) SCHEMATIC DIAGRAM FOR SWITCH CONTACTS MADE.
12. ▭ DENOTES EQUIPMENT MARKINGS.

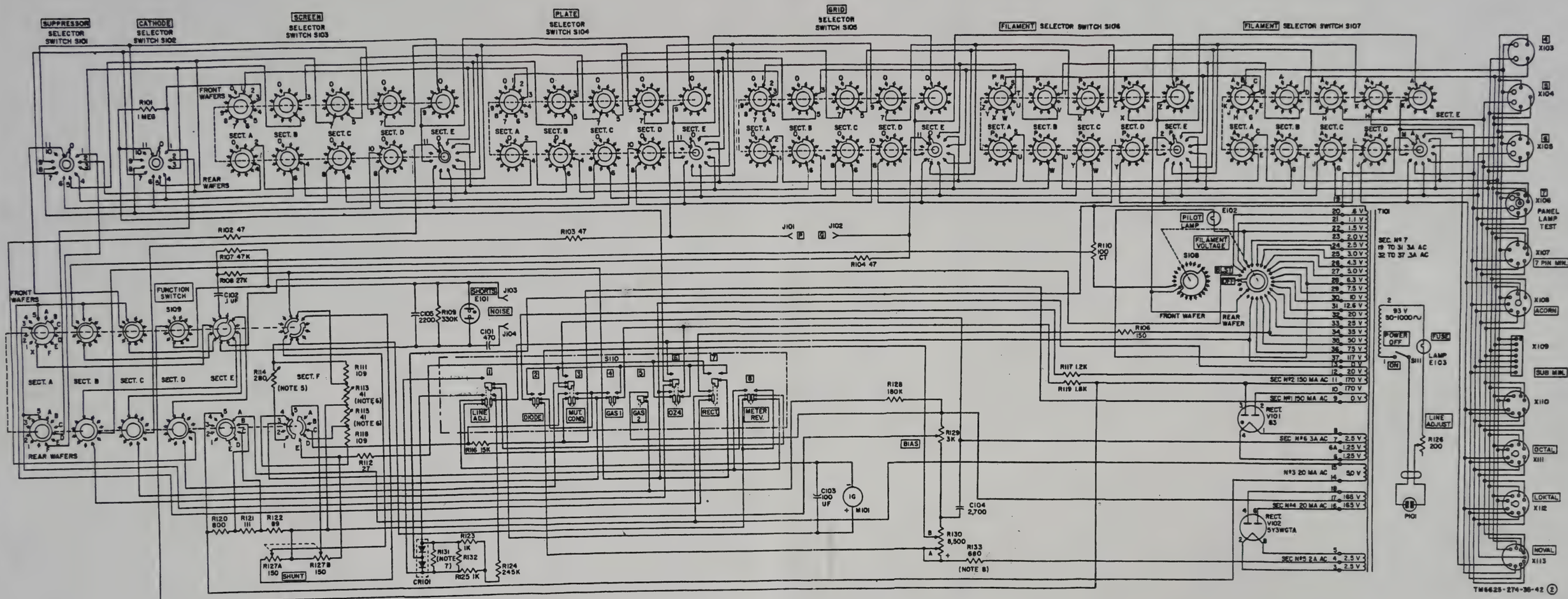
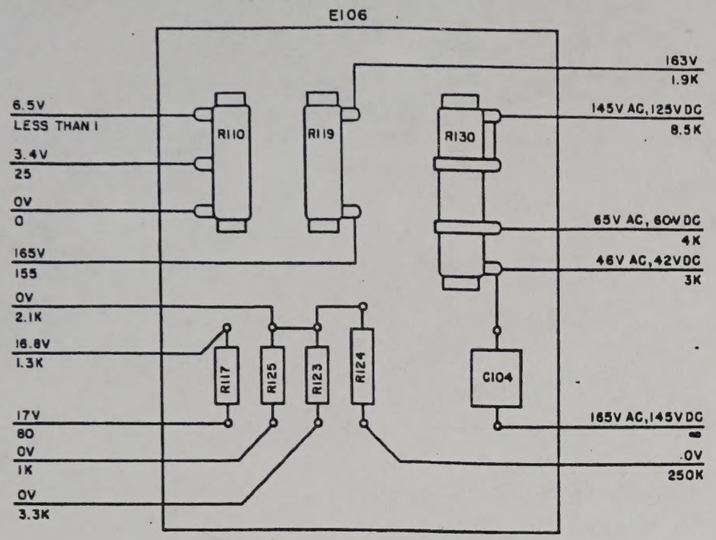


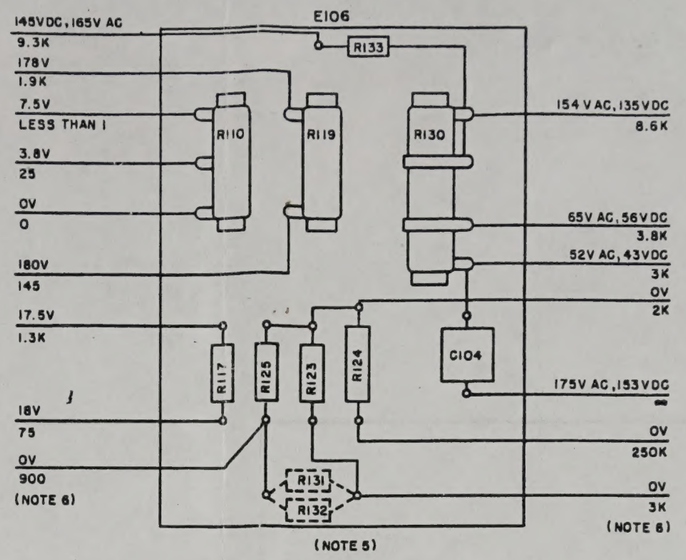
Figure 42(2). Test Sets, Electron Tube TV-7/U and TV-7A/U (serial numbers 1 through 1200), schematic diagram (sheet 2).

NOTES:

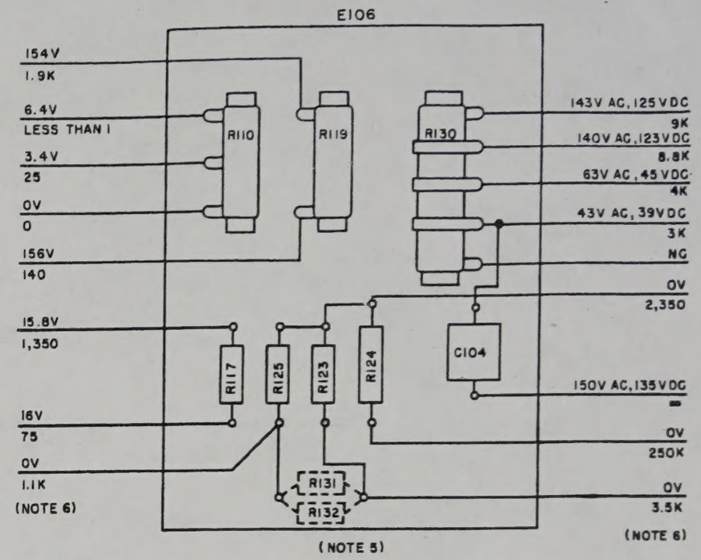
1. UNLESS OTHERWISE INDICATED, RESISTANCES ARE IN OHMS AND CAPACITANCES ARE IN UUF.
2. ALL SOCKETS ARE VIEWED FROM THE BOTTOM.
3. ALL ROTARY SWITCH SECTIONS ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION VIEWED FROM FRONT OR KNOB END OF SWITCH. SECTION A IS CLOSEST TO KNOB END.
4. [1] THROUGH [8] ARE PUSH BUTTON SWITCHES.
5. RESISTOR R114 IS NOT VARIABLE ON TV-7/U.
6. RESISTORS R113 AND R115 ARE NOT VARIABLE ON TV-7/U.
7. THE VALUES OF RESISTORS R131 AND R132 ARE DETERMINED IN PRODUCTION. IF USED, THE RESISTANCE RANGE IS 10K TO 20K. THESE RESISTORS ARE NOT USED ON TV-7/U.
8. RESISTOR R133, 680 OHMS, IS NOT USED ON TV-7/U.
9. THE VOLTAGES AT TRANSFORMER T101 WILL VARY DEPENDING UPON THE SETTING OF RESISTOR R126.
10. [ ] DENOTES EQUIPMENT MARKINGS.



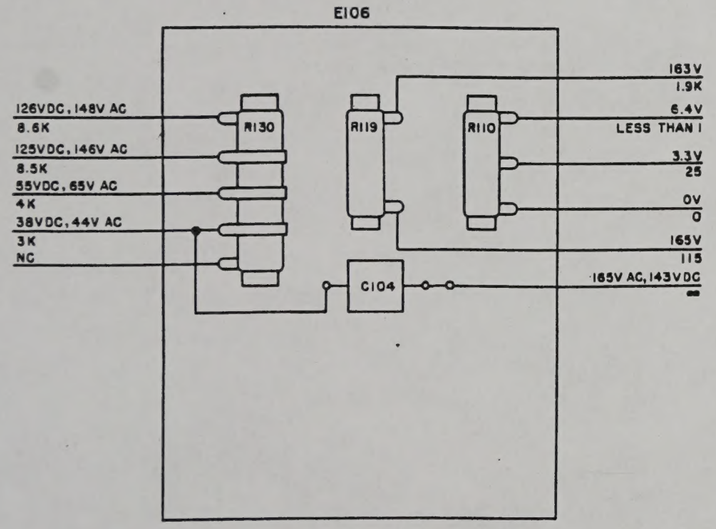
A. TV-7/U



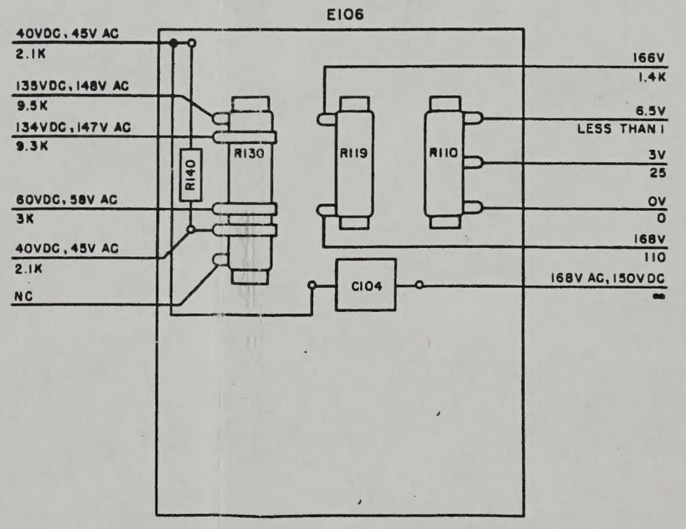
B. TV-7A/U, SERIAL NUMBERS
1 THROUGH 1,200



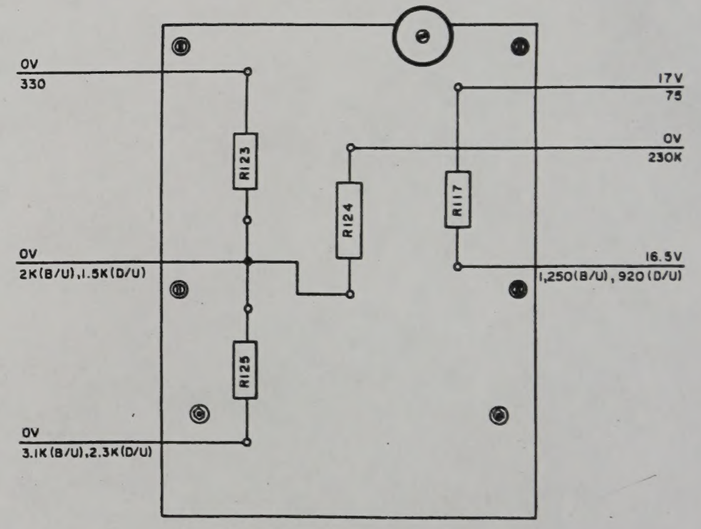
C. TV-7A/U, SERIAL NUMBERS
1201 THROUGH 9492



D. TV-7B/U



E. TV-7D/U



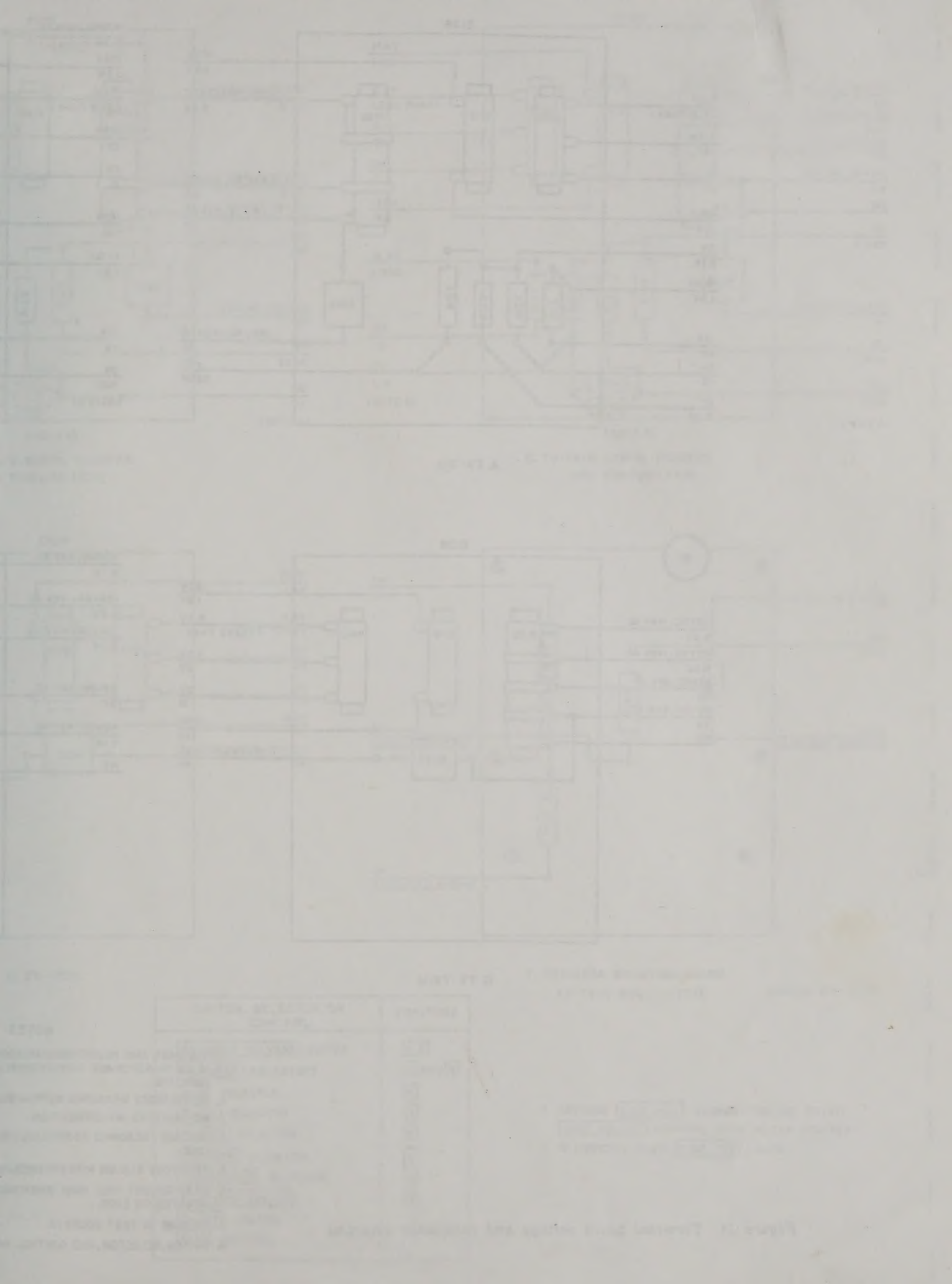
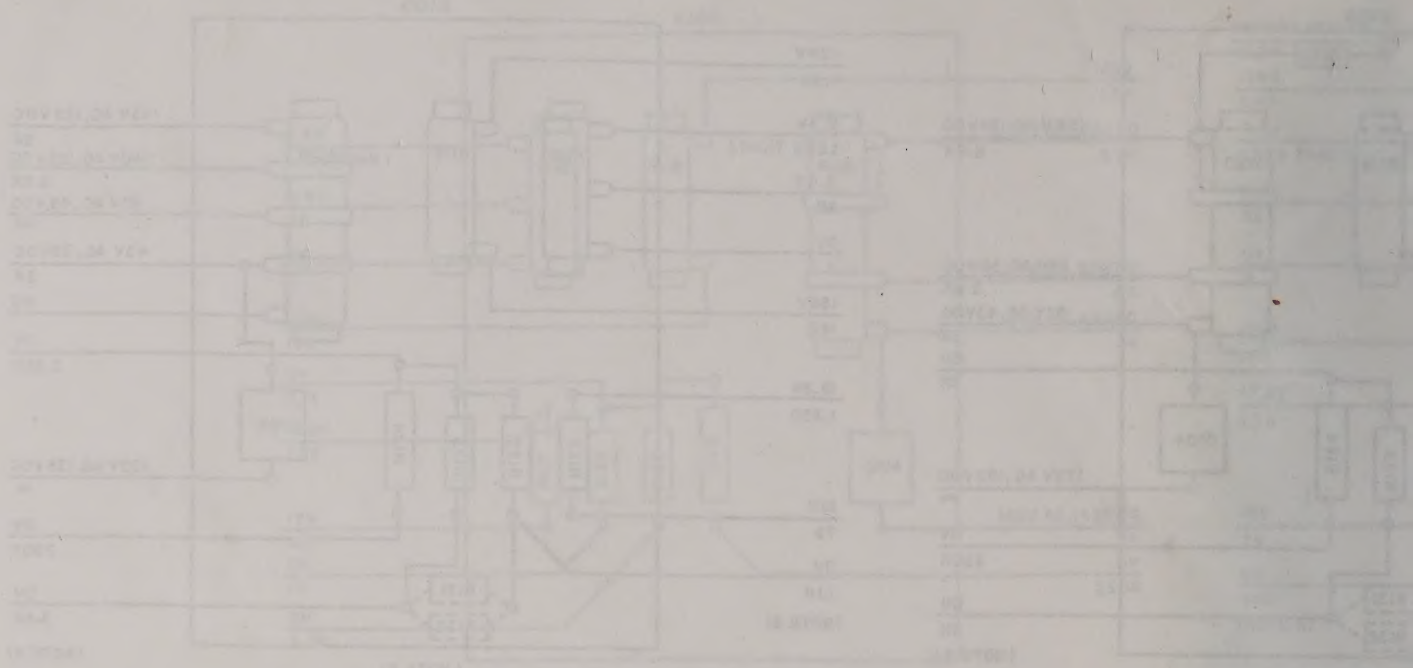
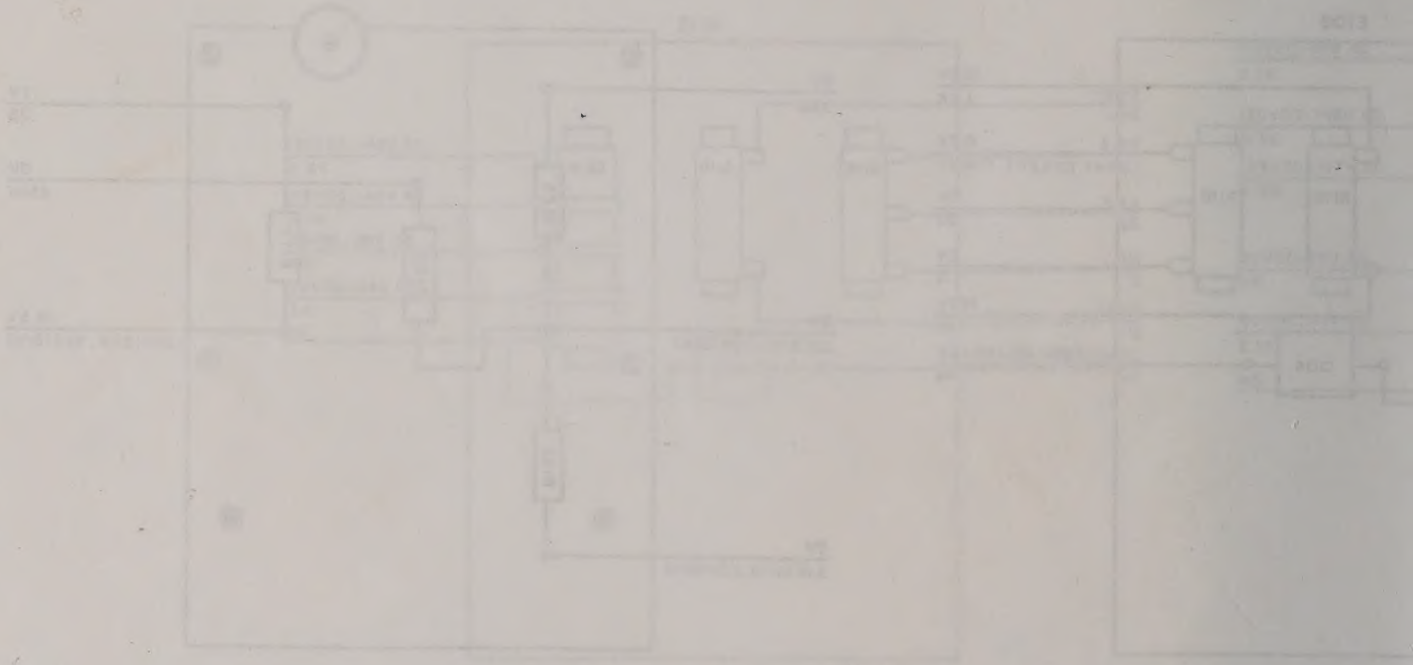
F. RESISTOR MOUNTING BOARD
TV-7B/U AND TV-7D/U

TM6625-274-35-34

Figure 33. Terminal board voltage and resistance diagram.

NOTES:

1. VOLTAGES AND RESISTANCES MEASURED IN RESPECT TO TERMINAL 19 ON TRANSFORMER T101. VOLTAGES ARE AC UNLESS OTHERWISE INDICATED.
2. DC VOLTAGES MEASURED WITH A 1000 OHMS-PER-VOLT METER.
3. NC INDICATES NO CONNECTION.
4. VOLTAGE READINGS ABOVE LINE, RESISTANCE READINGS BELOW LINE.
5. RESISTORS R131 OR R132, IF USED, WILL BE MOUNTED AS SHOWN.
6. MEASUREMENT WILL VARY WHEN RESISTORS R131 OR R132 ARE MOUNTED ON E106.
7. NO TUBE IN TEST SOCKETS.
8. SWITCH, SELECTOR, AND CONTROL POSITIONS:

SWITCH, SELECTOR, OR CONTROL	POSITION
FILAMENT VOLTAGE SWITCH	6.3
FILAMENT SELECTORS	H AND S
GRID SELECTOR	5
PLATE SELECTOR	3
SCREEN SELECTOR	4
CATHODE SELECTOR	6
SUPPRESSOR SELECTOR	0
FUNCTION SWITCH	B
SHUNT CONTROL	0
BIAS CONTROL	0

9. DEPRESS LINE ADJ. PUSHBUTTON AND ROTATE LINE ADJUST CONTROL UNTIL METER POINTER IS DIRECTLY OVER LINE TEST MARK.